VOL. XXXVI. No. 8. AUGUST 1951

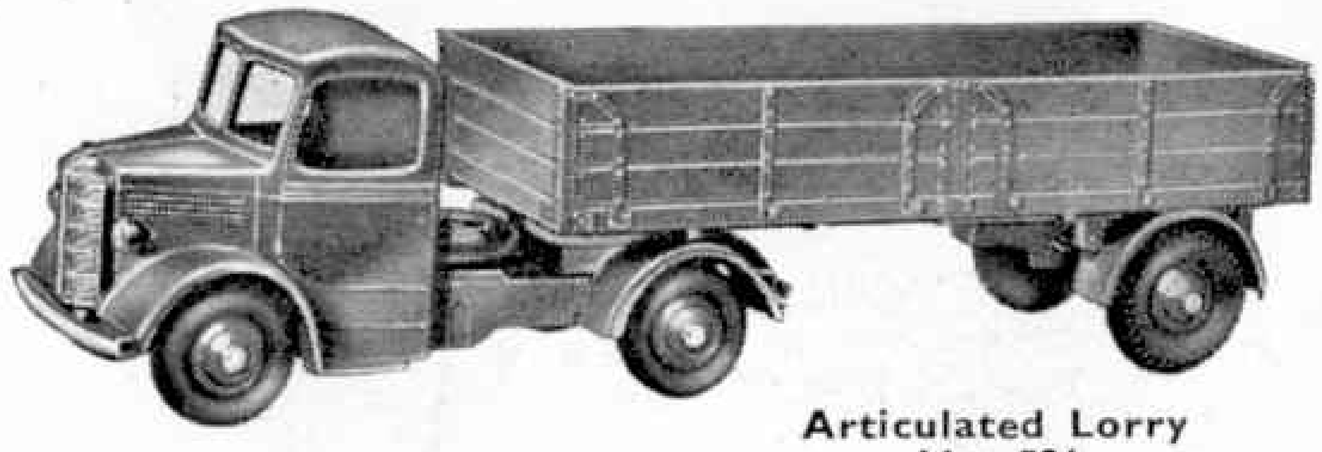
MECCANO MAGAZINE

POWER DIVE

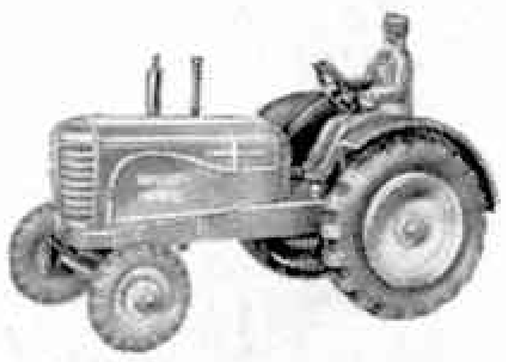
9D.

DINKY TOYS

Hudson
"Commodore" Sedan
No. 139b

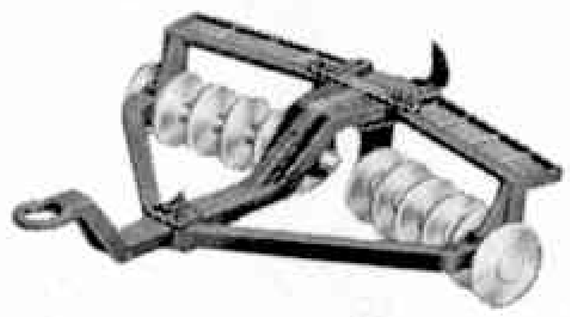


Articulated Lorry
No. 521



Massey-Harris Tractor
No. 27a

Harvest Trailer
No. 27b



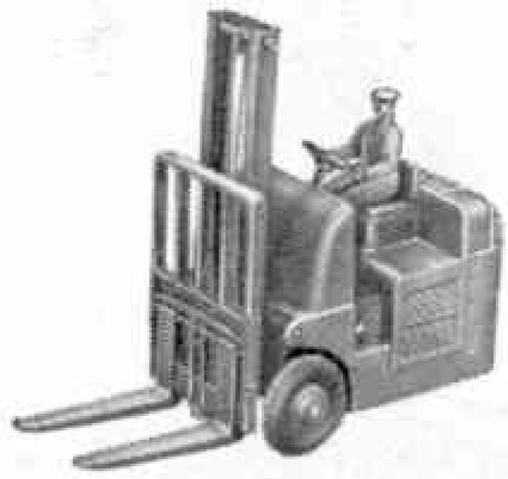
Disc-Harrow
No. 27h

Ford "Fordor" Sedan
No. 139a

Refuse Wagon
No. 25v

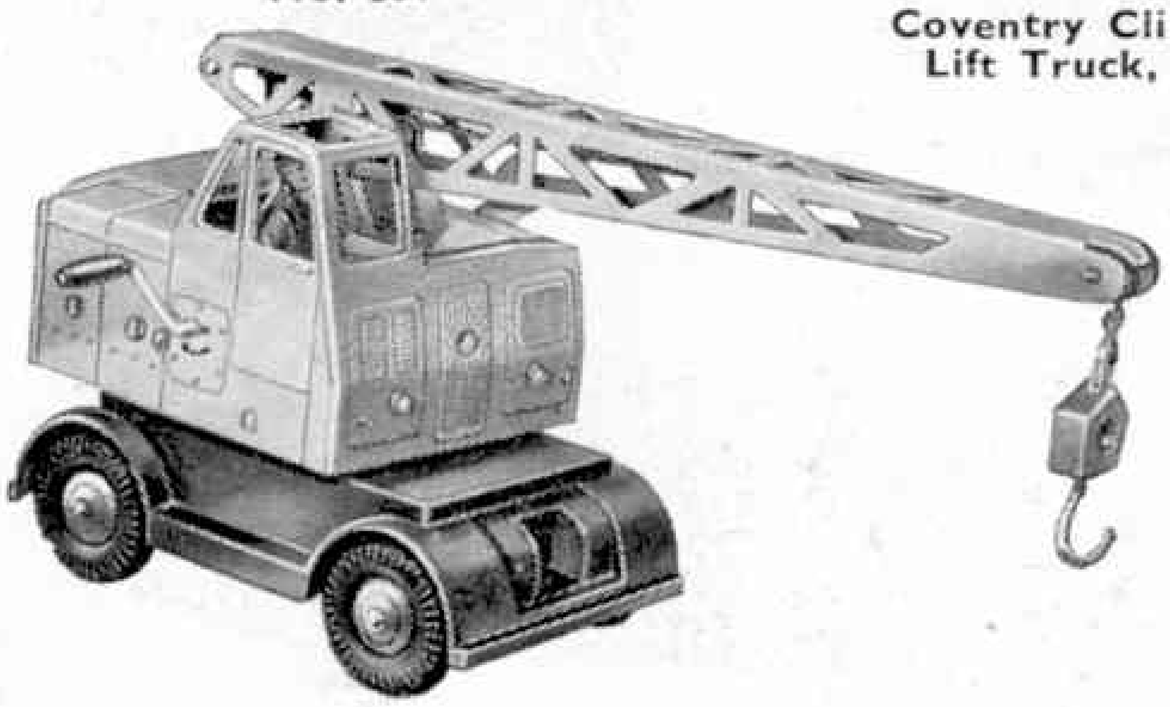
Rover 75 Saloon
No. 140b

Electric Dairy Van
No. 30v

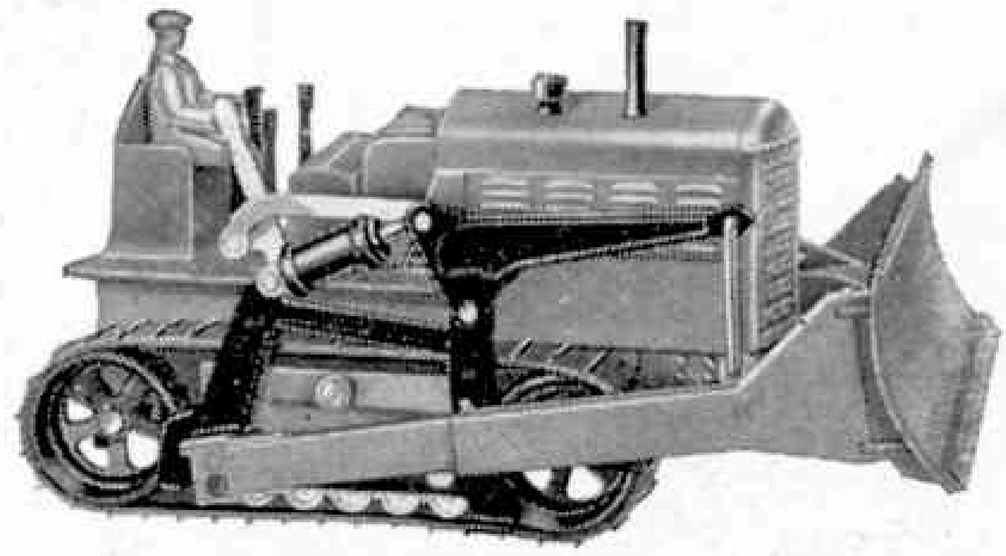


Coventry Climax Fork
Lift Truck, No. 14c

Austin 'Atlantic' Convertible
No. 140a



Coles Mobile Crane
No. 571



Blaw Knox Bulldozer
No. 561

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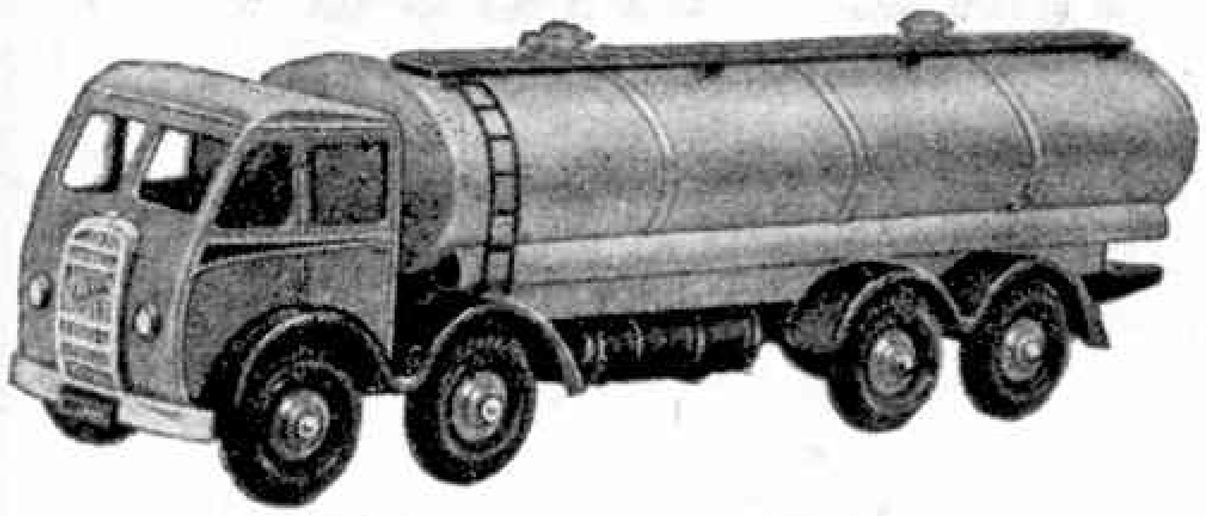
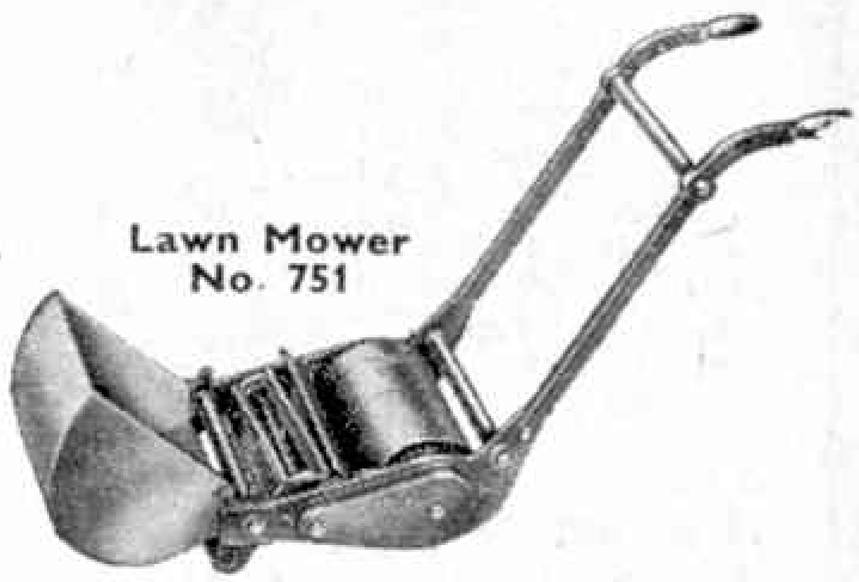
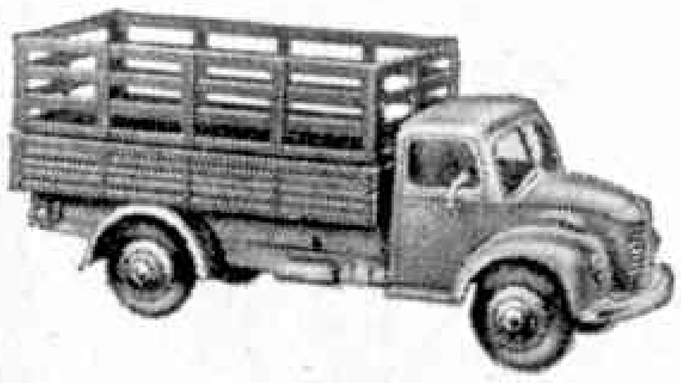
DINKY TOYS



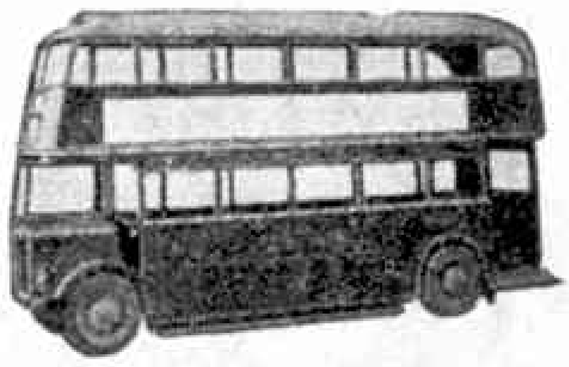
Foden 14-ton Tanker, No. 504



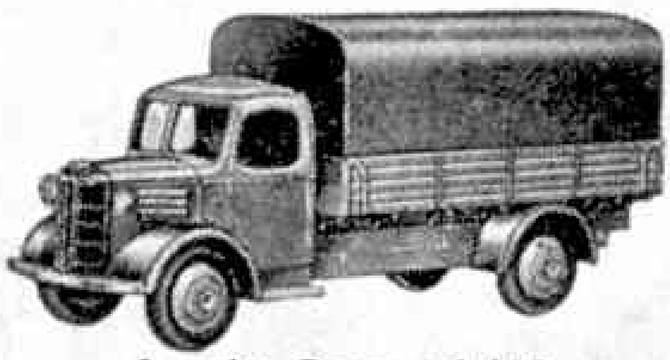
Lawn Mower
No. 751



Farm Produce Wagon
No. 30n

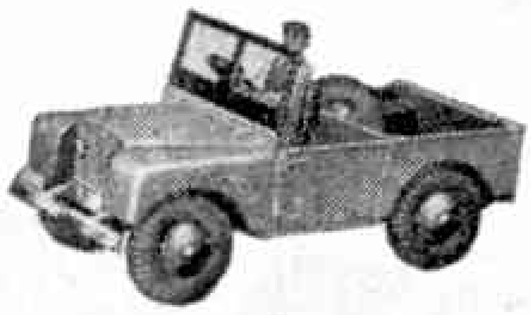


Double Deck Bus
No. 29c

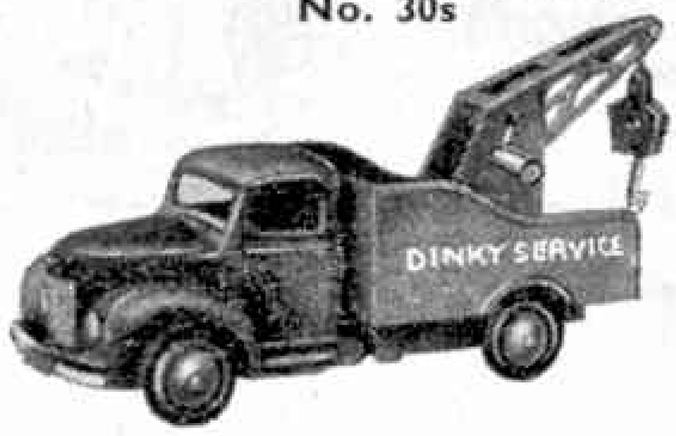


Austin Covered Wagon
No. 30s

The Standard "Vanguard"
Saloon, No. 40e

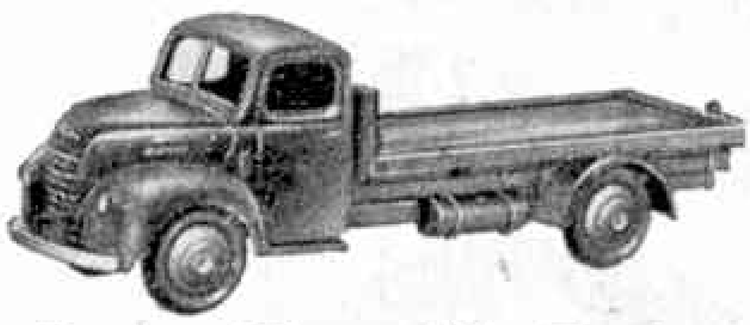


Land-Rover
No. 27d



Breakdown Lorry
No. 25x

Hillman Minx Saloon
No. 40f



Fordson 'Thames' Flat Truck
No. 30r

Rear Tipping Wagon
No. 30m

Observation Coach
No. 29f

Guy 4-ton Lorry
No. 511

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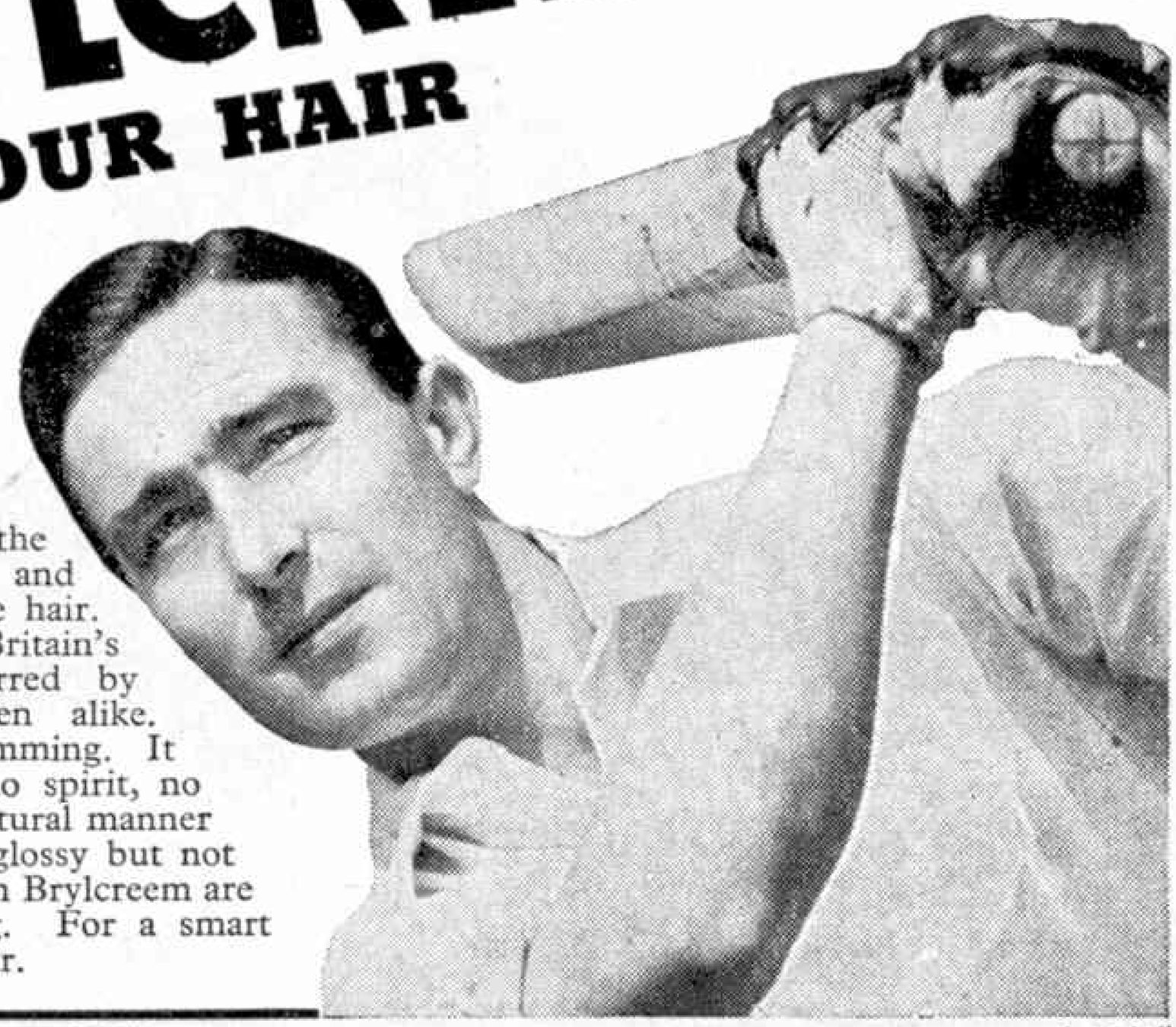

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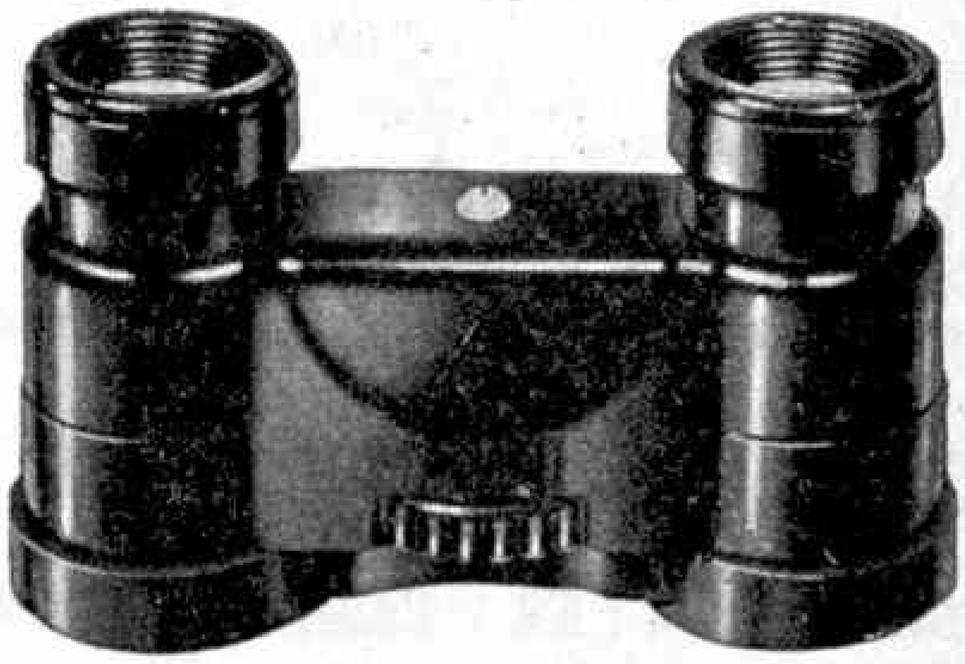

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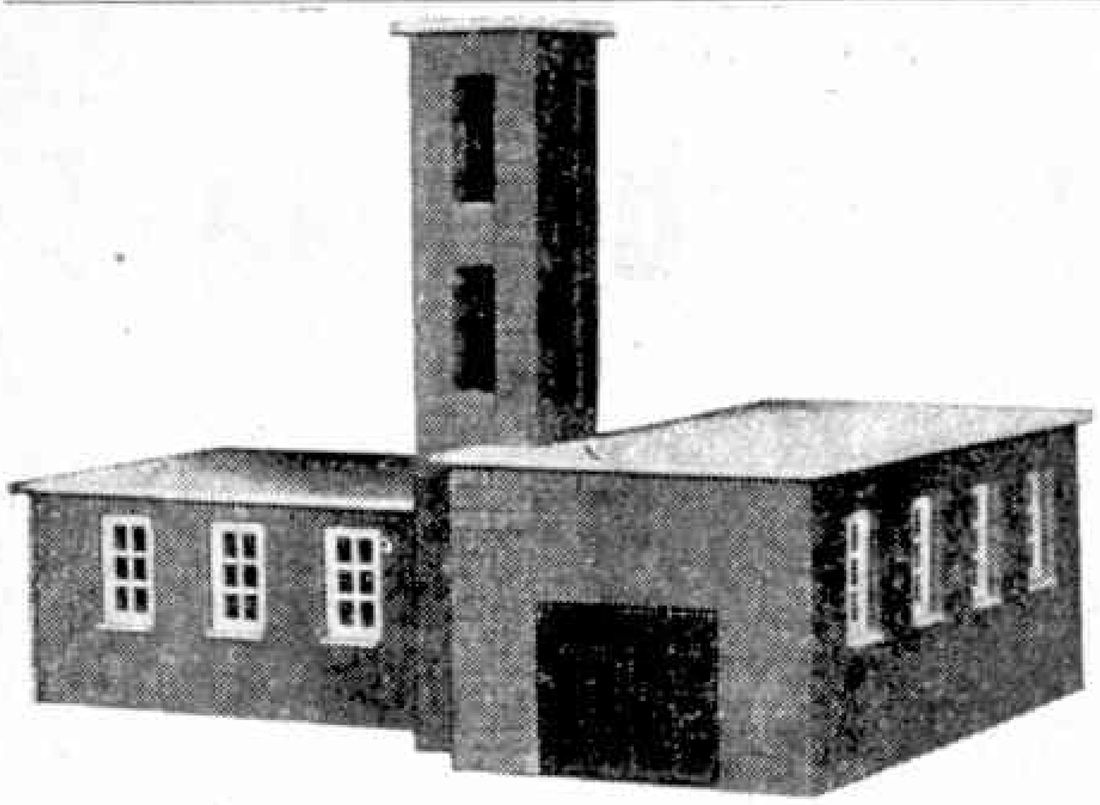

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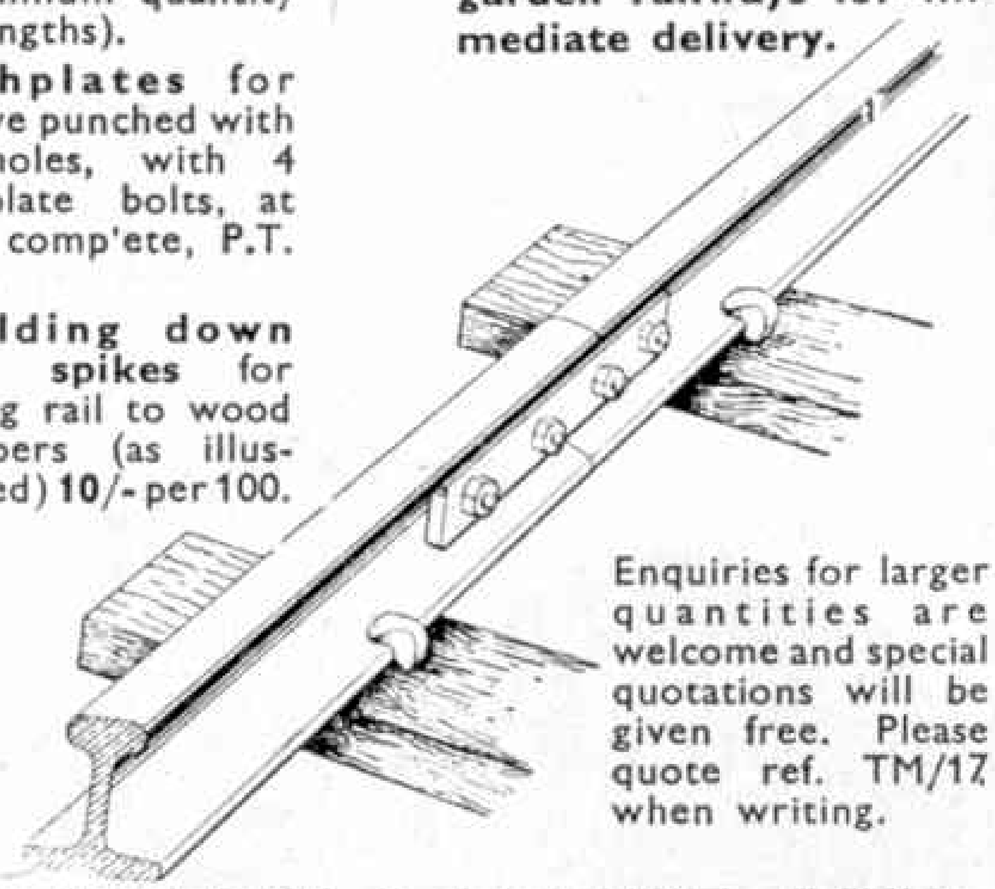

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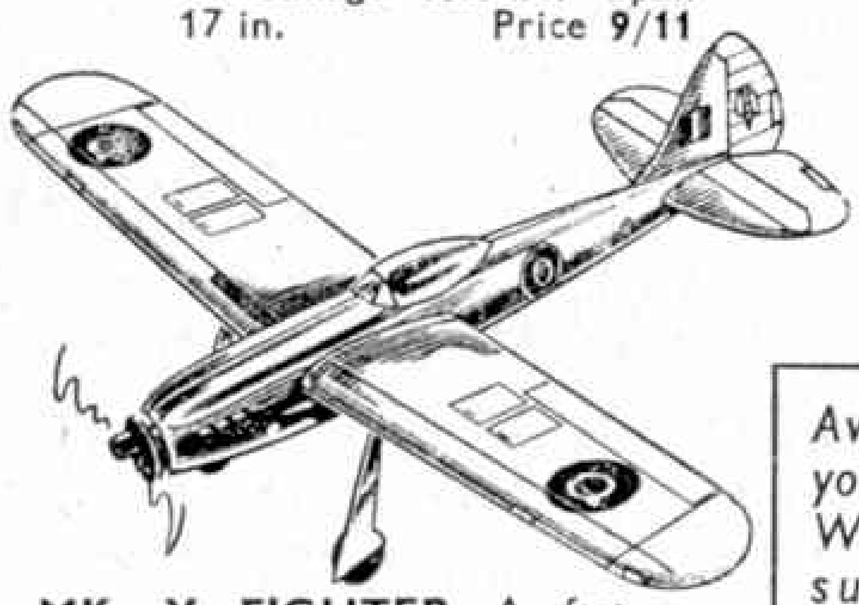

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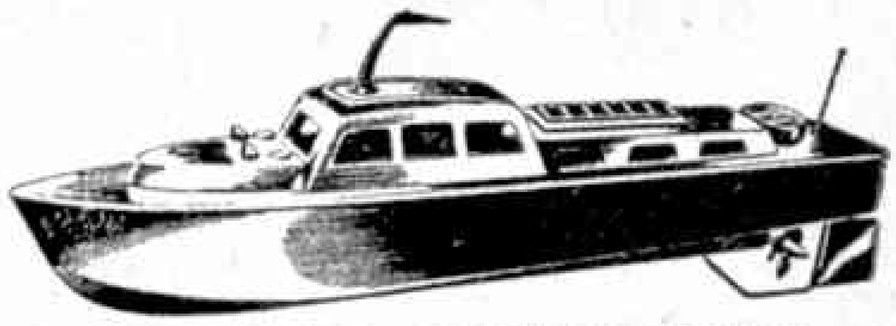

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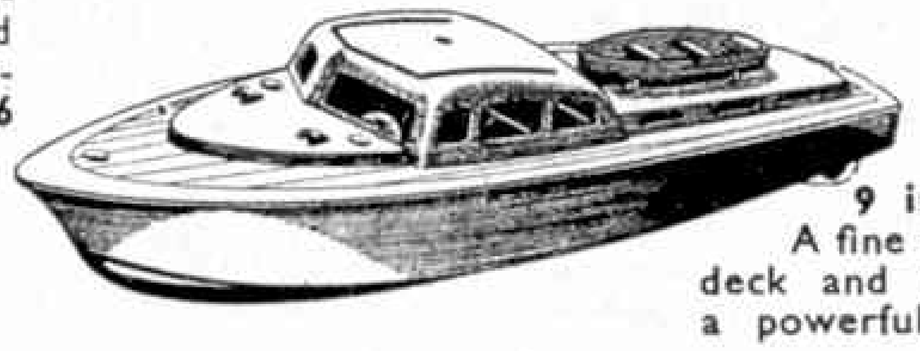

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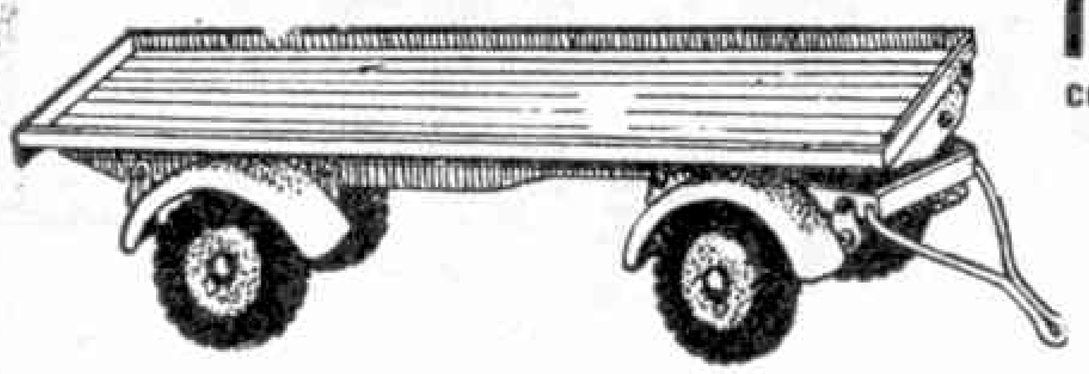

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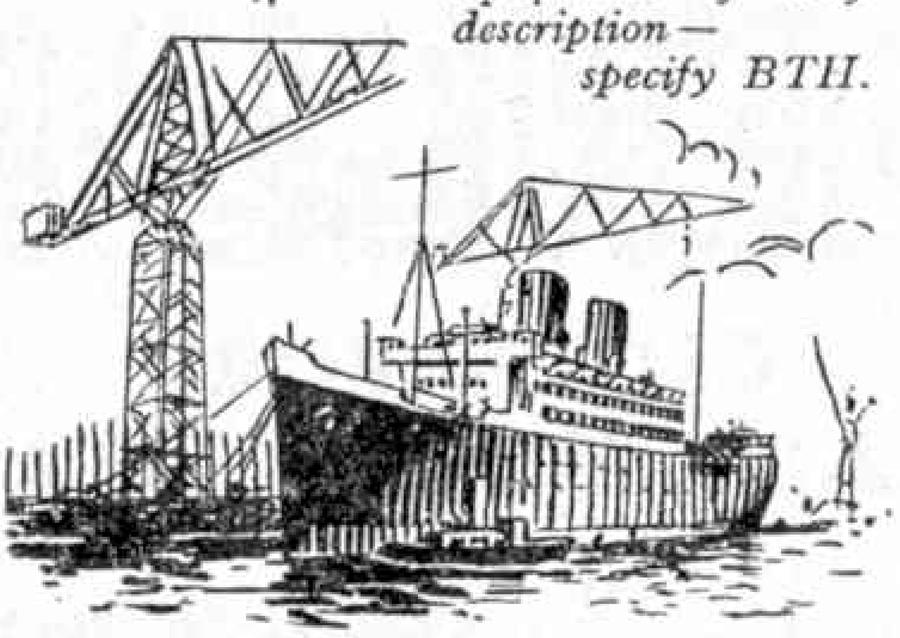

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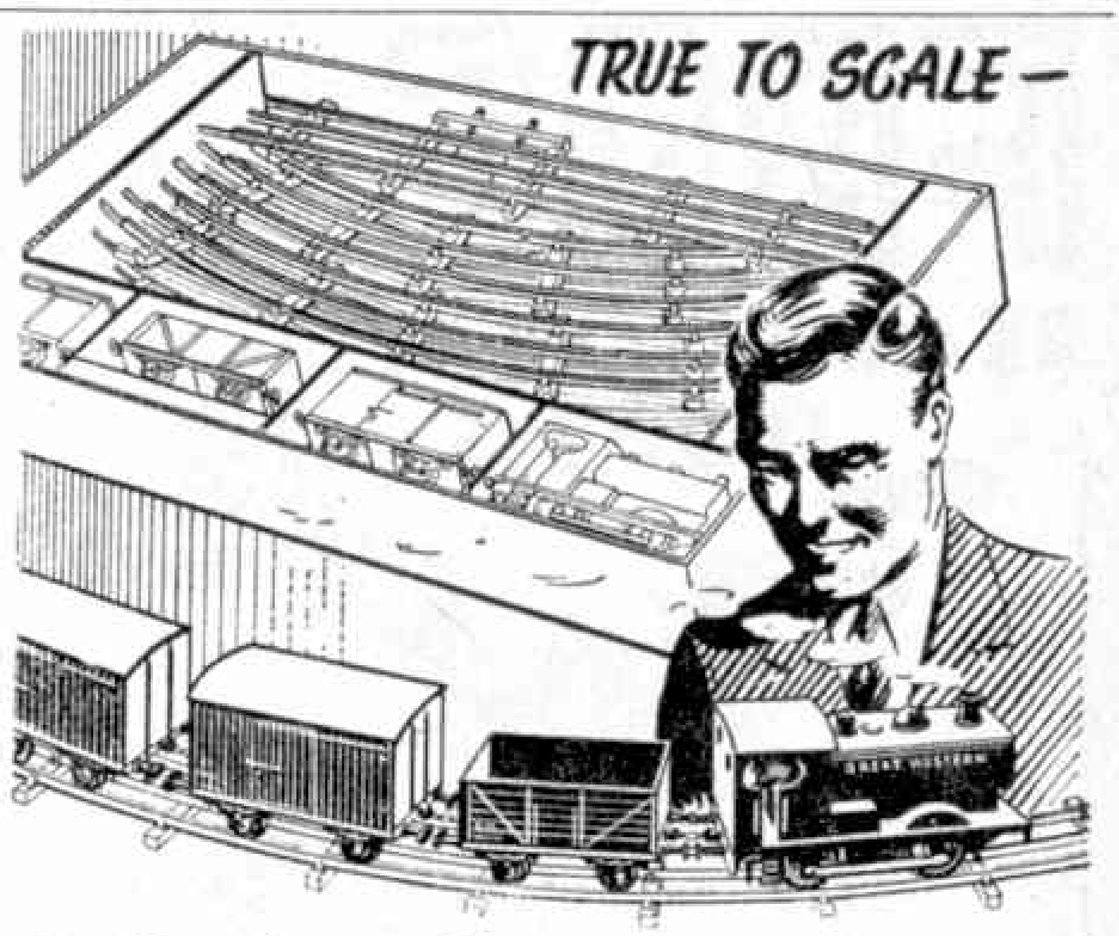

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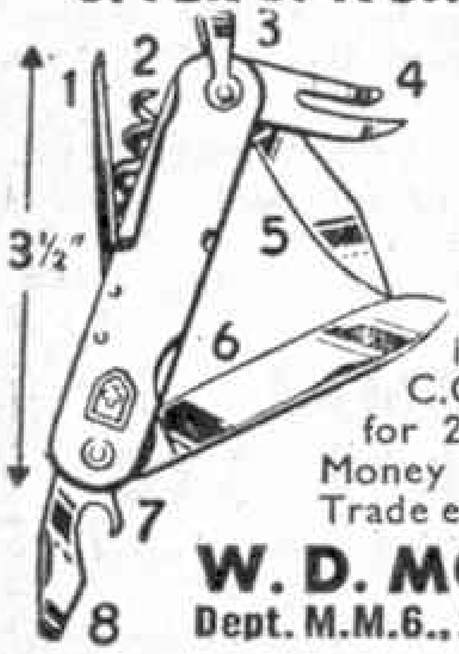

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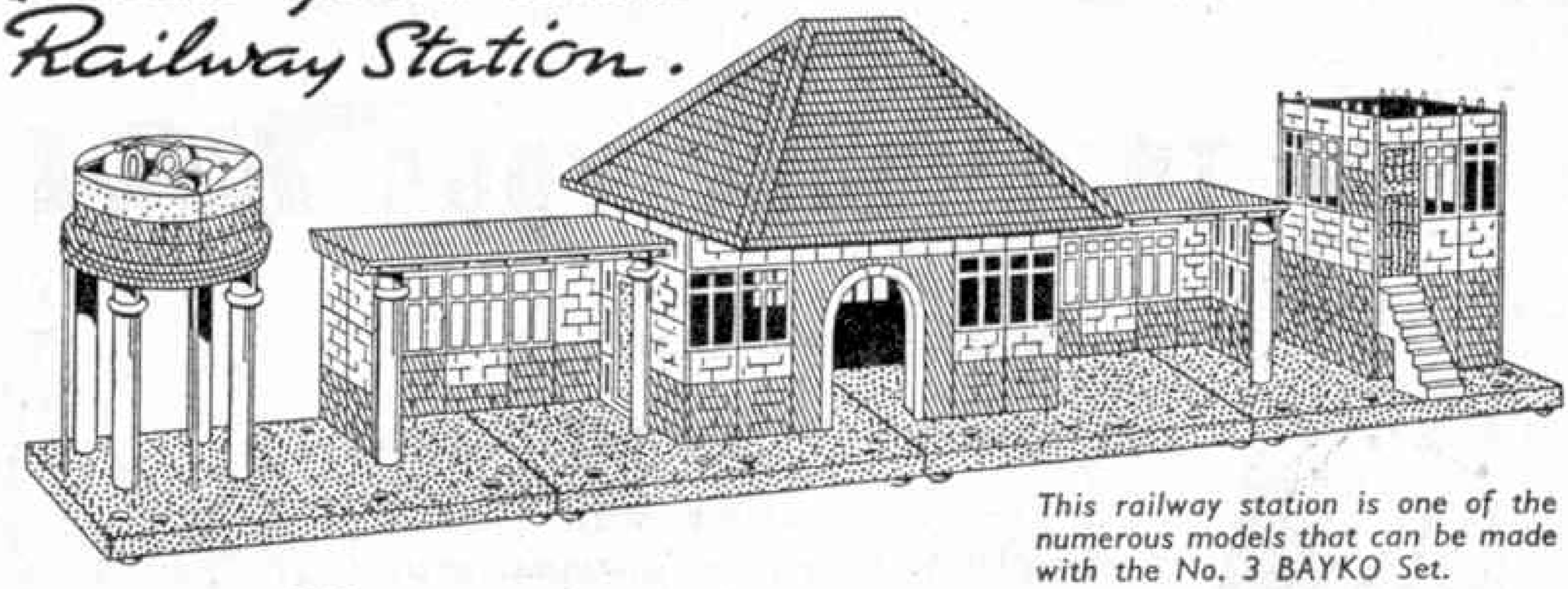

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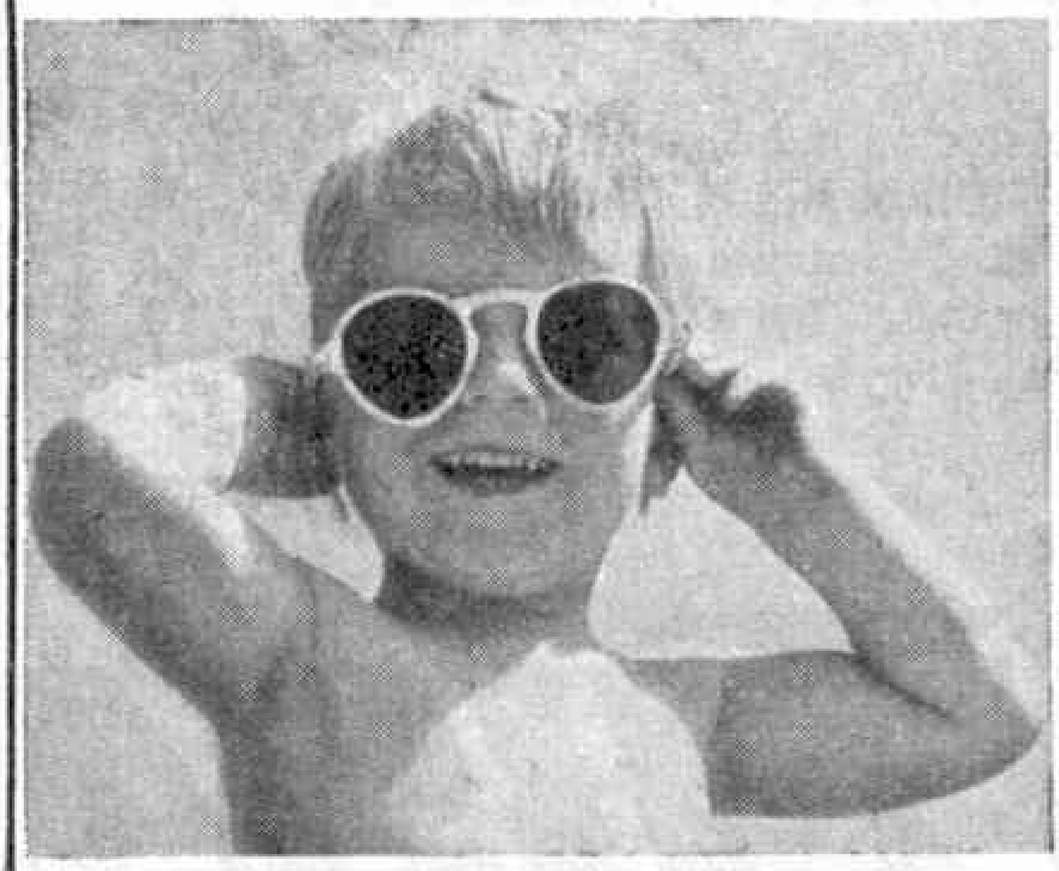


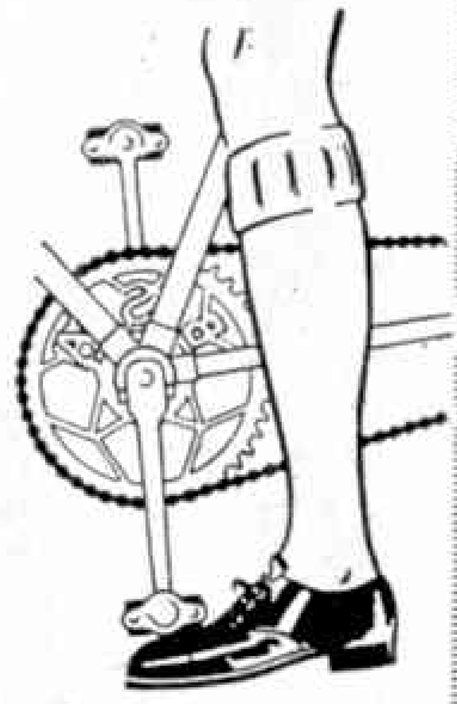
ILFORD SELOCHROME FILM

HOW TO CHOOSE YOUR BSA

Here's one important test

GET THE RIGHT SADDLE HEIGHT

SIT ON THE SADDLE with your leg straight, and the pedal down as far as it will go. You should be able to place your toe comfortably *underneath* the pedal. Adjust saddle height to give you this position.



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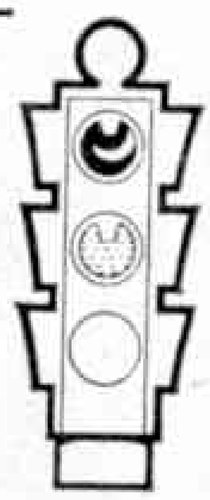
JUNIOR ROADSTER

SAFETY MODEL



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MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

Vol. XXXVI
No. 8
August 1951

With the Editor

A Century of Aluminium

One of the most interesting of the small exhibitions arranged in connection with the Festival of Britain is that staged by the Aluminium Development Association at their headquarters, 33, Grosvenor Street, London W.1. This exhibition, which remains open until 28th September, is designed to show the phenomenal growth of aluminium from a chemical curiosity in 1851 to a metal of primary industrial importance to-day.

In 1809 the British chemist Sir Humphrey Davy produced an alloy of aluminium and iron by passing electricity through alumina or aluminium oxide. Other scientists followed with chemical methods of separation, including the Danish chemist Oersted, the centenary of whose death has just been celebrated in Denmark by the issue of a special postage stamp. Chemical methods were tedious and expensive, however, and the first really great advance towards commercial production was made in 1886 by the discovery, almost exactly at the same time, of electrochemical processes by Héroult in France and Hall in America.

The exhibition shows a variety of interesting articles made in England between 1887 and 1891, when the price of the metal was £4 or £5 per lb. During the next ten years, as the result of electrolytic process developments in France, Switzerland, America, and by the British Aluminium Co. Ltd. in Scotland, the price fell rapidly, reaching 2/6 per lb. in 1894.

Other exhibits show the use of aluminium for aircraft during the 1914–1918 war, and link these up with the widespread use of the metal to-day for building and structural engineering. One of the most striking examples is the first all-aluminium bridge in the world, opened at the port of Sunderland in 1948; and the choice of aluminium for the Dome of Discovery and other buildings at the South Bank Exhibition is an appropriate tribute to the value of the metal.

Readers may be interested to know that the "Eros" statue, the famous London landmark, was cast in aluminium in 1893.

The whole subject is so interesting that I intend to devote a long illustrated article to it in the near future.

Our Cover Picture

The remarkable picture on our cover this month shows a Gloster "Meteor" 8 jet fighter in a vertical dive. The machine is carrying a heavy load of rocket projectiles, stowed under the wings; and the picture was taken by Russell Adams, photographer of the Gloster Aircraft Co. Ltd., by whose courtesy it is reproduced.

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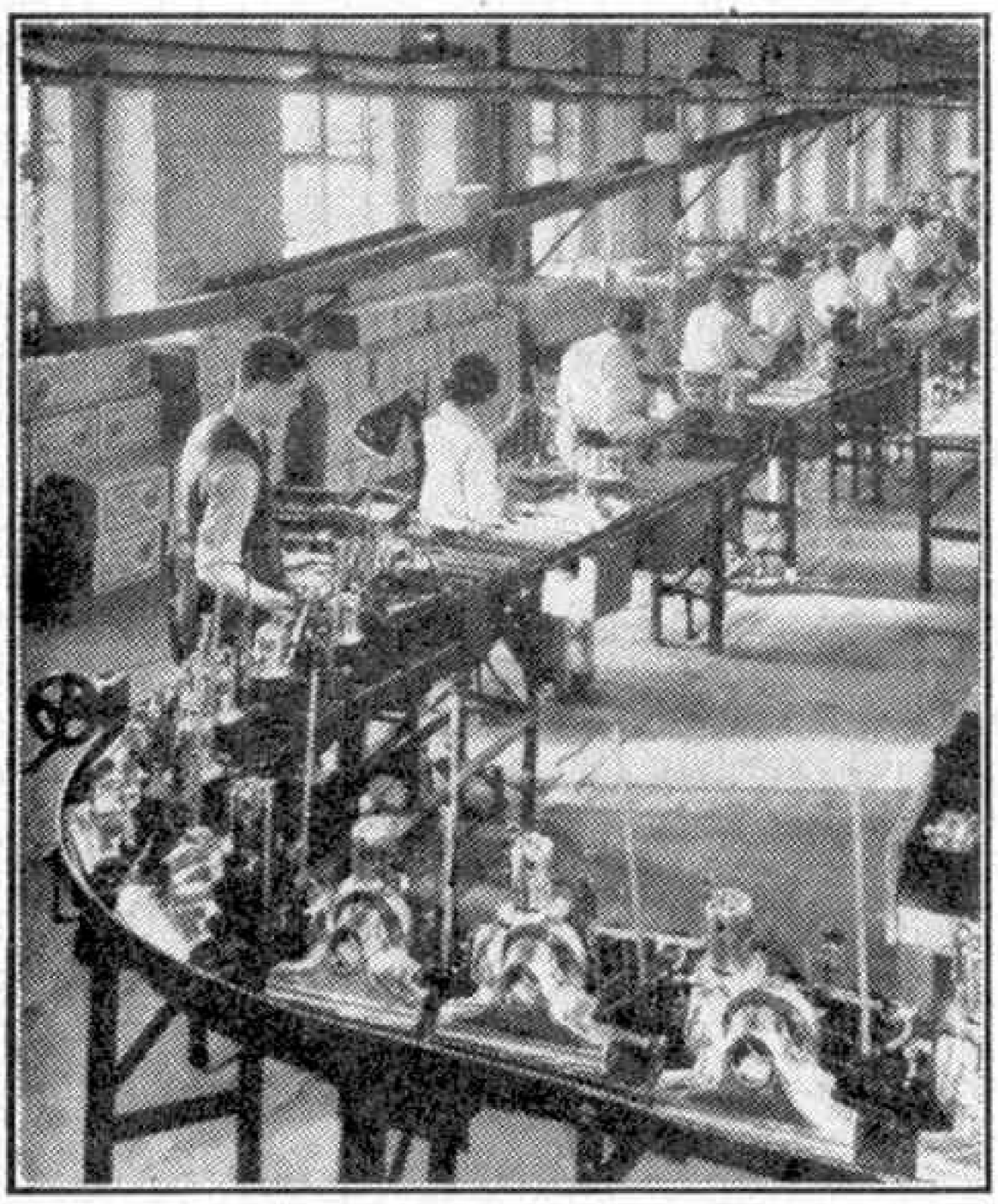
Marvels of Modern Conveyors

By Trevor Holloway

INDUSTRY to-day is being called upon for greater production than ever before in a desperate bid to stabilise our finances. Men, machines and assembly lines are turning out an enormous range of goods on a scale undreamed of a generation ago. In this all-out effort, mechanical handling is playing a vital part, and some of the modern conveyors are almost human in performance.

Any factor that tends to delay production can no longer be tolerated. If an operator has to wait for materials, or even walk to the other end of the room to fetch them, it entails a loss of productive time. Actually, a single unnecessary step, or a long stretch of the arm, represents an alarming waste of time and energy when viewed from the long term angle.



Electrical appliances travelling on a gravity conveyor. The illustrations to this article are reproduced by courtesy of Herbert Morris Ltd.

Some readers may have imagined that conveyors benefit only the larger mass-production firms, or that they are something in the nature of a "luxury." This is far from true, for even very small businesses have found that to be able to keep people working without walking not only cuts costs but steps up production considerably. It may be only a small belt-conveyor installation or a short length of roller conveyor from one side of the room to another, but it makes for orderly and uninterrupted production flow.

No matter what the job, there is a type of conveyor available to deal with the handling of the goods—during manufacture or after. Bacon, buttons, sides of beef, car components, blocks of granite or bales of feathers—the various conveyors take them all safely and speedily on their way. Goods keep moving instead of cluttering up floor-space; trucks and trolleys can be dispensed with, and there is a quiet and orderly efficiency instead of conditions bordering on chaos.

Gravity is a source of power that costs nothing to maintain, hence gravity roller conveyors are widely used. These consist of numerous rollers mounted in standard lengths of framework supported underneath by adjustable stands. By engineering a gentle slope throughout its length the gravity conveyor can be made to serve one or more departments as required. Partly-finished components placed on the conveyor can snake their way from room to room with no fuss or bother, and en route they can be detained for further assembly, etc., then sent on their way again so that at the end of the run they may be ready for despatch. In other words, the goods have come to the worker and not the worker to the goods.

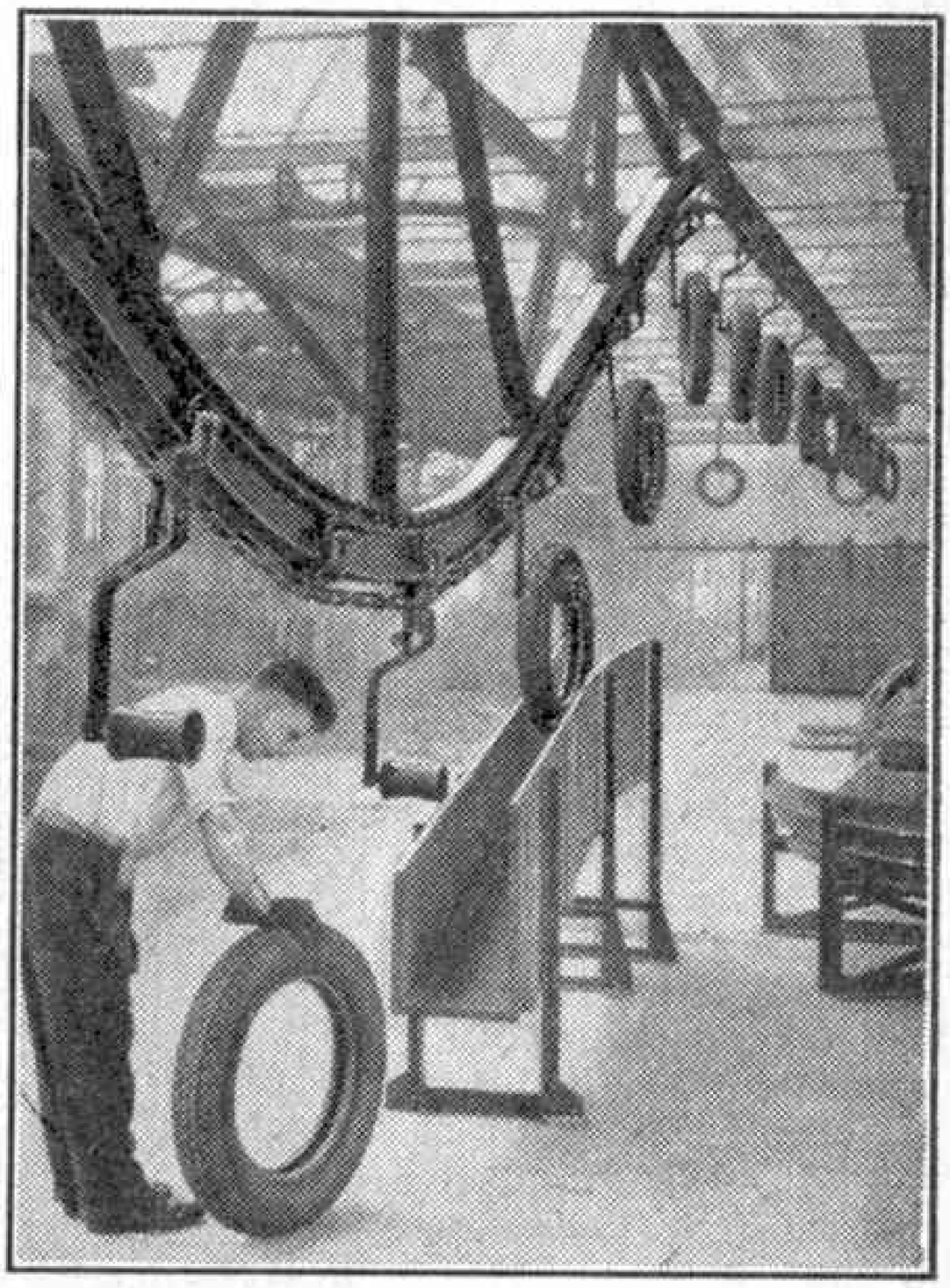
Straight sections are usually 10 ft. or so in length; and there are 45 and 90 degrees curved sections for negotiating corners, cross-over and switch sections for diverting goods into "sidings" or along different routes, or for by-passing departments, and so on.

But what if departments are on different levels and the trackway has to climb upward at any point along its route? In such cases powered sections have to be inserted to elevate the goods. These sections are driven by small electric motors, with chain drive on to one end of the shaft of the end roller. On the other end of this shaft is a mitre gear driving the shaft, which in turn drives

rollers at fixed intervals up the incline. An alternative to this method is a chain drive on a principle similar to that of a tandem bicycle. It will be appreciated that by combining the service of power and gravity sections of track, a whole factory could be served by roller conveyor economically and efficiently.

The amount of slope required on a gravity conveyor depends upon the nature of the load to be moved. As a general indication it may be said that a 3 per cent. gradient (3 ft. in 100 ft.) suits the average load with a hard flat bottom. Light loads, say from 10 lb. to 30 lb., will require a gradient of 4 per cent., while 5 per cent. or more should be allowed for loads under 10 lb. Soft goods, however, may need a 10 per cent. gradient to keep them moving.

By means of overhead chain conveyors, goods of all kinds up to two tons in weight can be distributed throughout all parts of a factory or warehouse. Sacks of hops, bales of cloth, castings, cycle frames and so forth can glide on their way by air, so to speak, without obstructing floor space. Chain conveyors are of course power driven. They consist of a number of trolleys running on an endless steel track and propelled by an endless power-driven chain. The chain itself is driven by means of a toothed wheel mounted on a shaft, at the opposite end of which is a single train of bevelled gears driven by an electric motor coupled to reduction gear so as to give the required speed. Slung from the trolleys are trays



Motor car tyres travelling on an overhead chain conveyor.

or hooks, specially designed for carrying the particular product the factory deals in. Very often the loads for chain conveyors are brought up and hooked on by an ingenious arrangement of roller conveyor, the chain conveyor taking over where the roller conveyor leaves off.

Of special interest in connection with chain conveyors is the Morris patented system of selective distribution. Here is how it operates in leading car manufacturing works. The assembly lines are fed with complete wheels, all ready to slide on to the axles as the chassis moves into the correct position. A stores-man places a wheel on a passing chain conveyor tray, then he takes a quick glance at the wheel chutes feeding the assembly line. He sees that wheel-chute No. 5 is running short of wheels, so he sets the dial of the selective delivery device to 5.

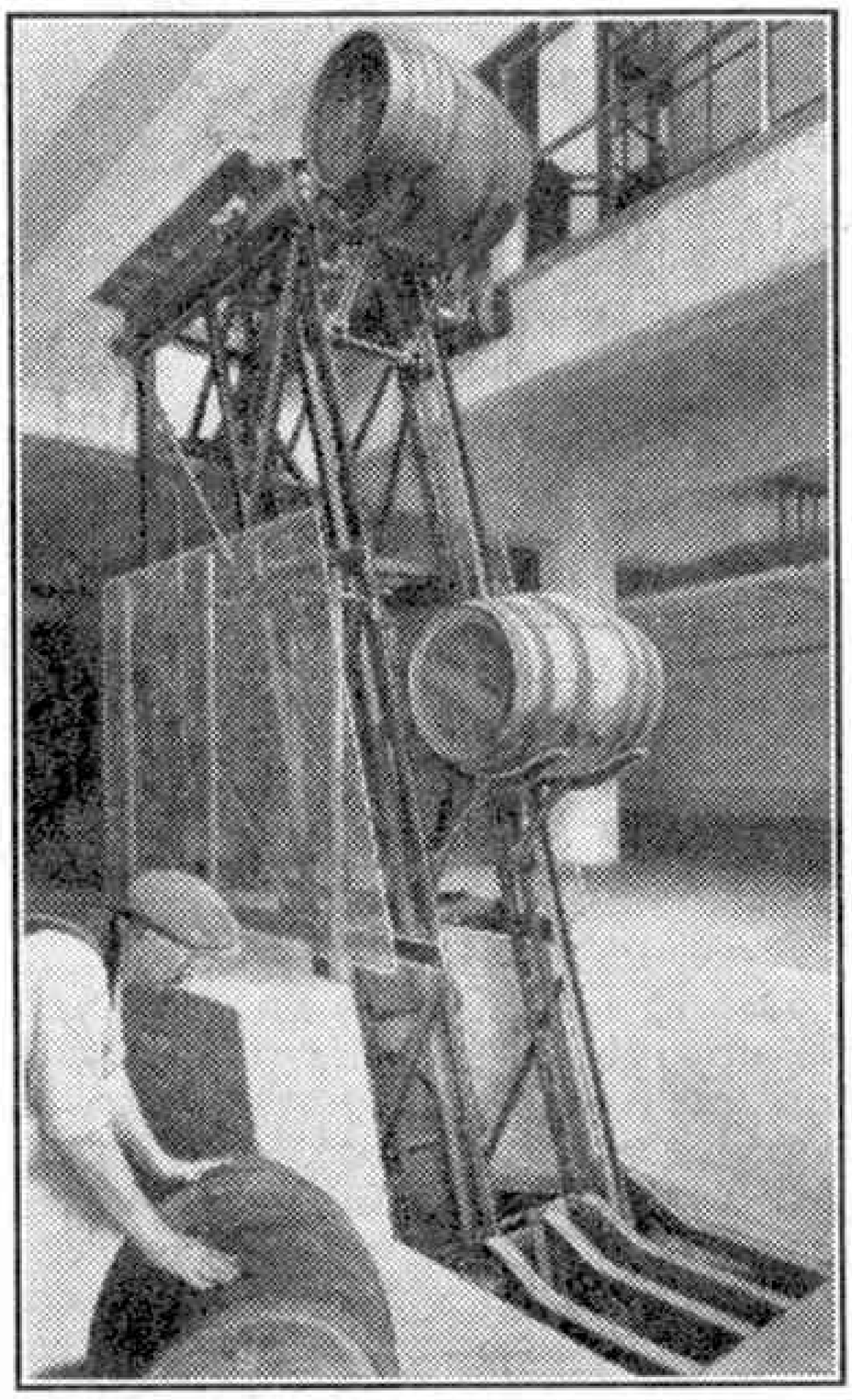
Away goes the tray, ignoring chutes 1, 2, 3 and 4, but on reaching 5 a mechanism comes into operation that tips the tray to a gentle angle and down goes the wheel into chute 5, the chute being so designed that the wheel changes from the horizontal

Adjustable sack-piler.

position to the vertical ready to be lifted out of the trough and on to the axle.

Here is another example of the value of this selective discharge device. From the office, order slips are sent out continuously to a number of stores-men. Each can add his parts to the order and forward to a second man, who finally completes the order and returns the slip, together with the goods, to the dispatch office. A conveyor so equipped is at once quicker, less expensive and more dependable than a corps of messengers. It does all the fetching and carrying—and it never forgets or makes an error. It seems the robot office boy is at last a reality!

There is another refinement along these lines, too. Each carrier can be equipped with a selective tripper arm so that when goods are sent from one station to a second, the tripper can be set for urgent orders and a bell is rung automatically at the second station before the goods are due to arrive, thus warning the stores-man to be ready for them.



Power-operated barrel conveyor.

If a chain conveyor is delivering goods or components faster than a department can deal with them, the carriers can be shunted into sidings until production flow evens out.

For the safe lowering of goods from top floor to ground level, conveyors sometimes take the form of spiral chutes, more or less on the lines of the helter-skelter seen at fun fairs. One well-known firm of sauce-makers have installed a seven-spiral gravity roller chute on which cases are sent circling gently and smoothly downward from the top of the factory to the loading bay some 30 ft. below. The spirals are carried on steel arms projecting from a central pillar, and a guard rail prevents the cases from slipping overboard as they descend.

For less fragile goods, such as sacks of flour or starch, plain spiral chutes built of steel plates are often employed—a much speedier method of lowering than lifts or pulley-block tackle.

There are of course many other conveyors. Table conveyors are particularly useful. Operatives sit around a long table, the central section of which consists of an endless travelling band or belt. An electric motor is used to drive the belt, and brings along in front of the operatives the various "bits and pieces" for sorting, assembly or packing, as the case may be. Thus, without rising from her chair, a girl can be kept continuously supplied with the particular component she requires, or partly finished products passed on down the line for further attention.

Mention must also be made of the growing use of portable conveyors for sack-piling, truck-loading and elevating generally. These units each has its own power unit and elevation is achieved by means of belts or slats. A 24 in. belt conveyor can handle or elevate at rates up to one ton a minute. One of the latest types used in sack-piling has a hinged boom which, when fully raised, reaches a stacking height of over 40 ft., the belt travelling at 80 ft. per minute. Only half a minute to send a sack to the top of a 40 ft. stack, and six or more sacks may be on the belt at any one time! The boom can be depressed when the first few layers of sacks are being built up, and later gradually lifted as the stack grows.

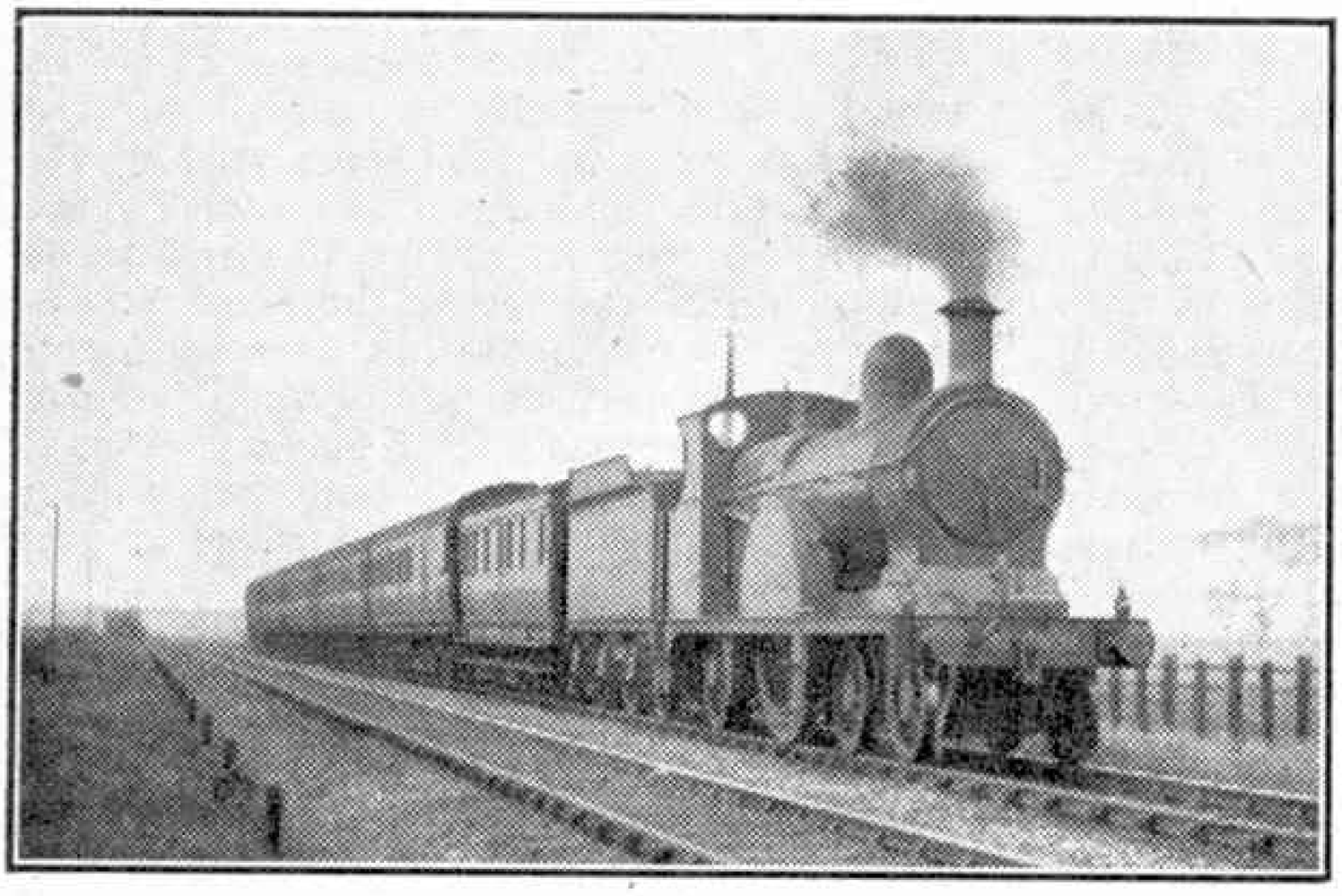
The warehouse of a well-known firm of chemists' suppliers is entirely serviced with conveyors on all its three floors. Basement, ground floor and first floor are all linked up. Goods are collected and delivered to all departments, and orders for despatch automatically discharged down chutes to the appropriate packing table on the ground floor.

Conveyors are (*Continued on page 382*)

Further Lineside Adventures with a Camera

By H. Gordon Tidey

IN my last article, in July 1950, I referred to the times when one could visit York, Newcastle, or above all Carlisle, to see the engines of several railways, all beautifully clean and resplendent in their own particular style of painting. Now anywhere in the north, including Scotland, we are restricted to former L.M.S. and L.N.E.R. engines, many of which are in a condition which makes it difficult, as often as not, even to read the number. In order to vary things a bit I devoted my annual railway photography week last year to the London Midland Region, visiting among other places, Warrington, Crewe, Lichfield and Stafford.



A typical C.L.C. express at Halewood in the days when the author first visited that line. The engine is a Great Central 4-2-2 No. 971, of the class long familiar on the Manchester-Liverpool expresses.

Starting my trip from London I travelled to Manchester by the *"Comet,"* leaving Euston at 9.45 a.m. behind rebuilt "Royal Scot" No. 46160 *"Queen Victoria's Rifleman."* We had an uninterrupted run as far as Weedon, after which there were signal delays and checks that caused a late arrival at Manchester by about 10 minutes.

Having made a trip to Bury by the electrified line, I started my photographic activities at Warrington, reaching that town via Earlestown Junction, whence there is a shuttle service worked by one of the little 2–4–2 tanks of Webb's design; another of these works a local service to St. Helens. Present-day "spotters" will find it hard to believe that these little engines were once responsible for many of the local services of the old L.N.W.R., including the London to Watford business service now provided by electric trains.

At Warrington (Bank Quay) I was just too late to get a shot at the up "Royal Scot" hauled by the pair of diesel-electrics Nos. 10000 and 10001. This town also boasts the Central Station, once the property of the Cheshire Lines Committee, with its 40-minutes "Punctual" Manchester and Liverpool expresses. How different now from the time when I spent a week on this line in the early 1920s! In those days many of the trains were worked by G.C.R. 4–2–2 single-drivers and various classes of the smaller 4–4–0s; representing the Midland interest were the graceful Johnson bogie 4–4–0s and "singles."

Nowadays this interesting line has been incorporated in the London Midland Region, although some of the locomotive working is still by later G.C.R. 4–4–0s of the "Director" class, and quite a number of coaches are still lettered "C.L.C." Some of former G.C.R. or G.E. design are to be seen as well. The late L.M.S. is represented by Standard Compounds and 2–6–0s, with an occasional "Black 5" or 6P 4–6–0 or class 2P 4–4–0. Single-drivers, alas, are now non-existent.

I went from Warrington to Crewe, which I made headquarters for a few days, travelling to Whitmore on the Friday and spending a very successful (and sunny) day operating at the troughs there. As part of an assorted "bag" I obtained an excellent picture of the up *"Royal Scot"* headed again by the diesel-electric twins. As a matter of interest such a picture makes for variety, but I have probably many of my young spotter friends with me when I say I should be the last to welcome the day when, and if, this method of propulsion supersedes our beloved steam engines. Photographically one cannot portray any sense of movement; there is no exhaust visible and the last

The up "Royal Scot" at Stafford headed by No. 46221 "Queen Elizabeth" in B.R. blue livery.

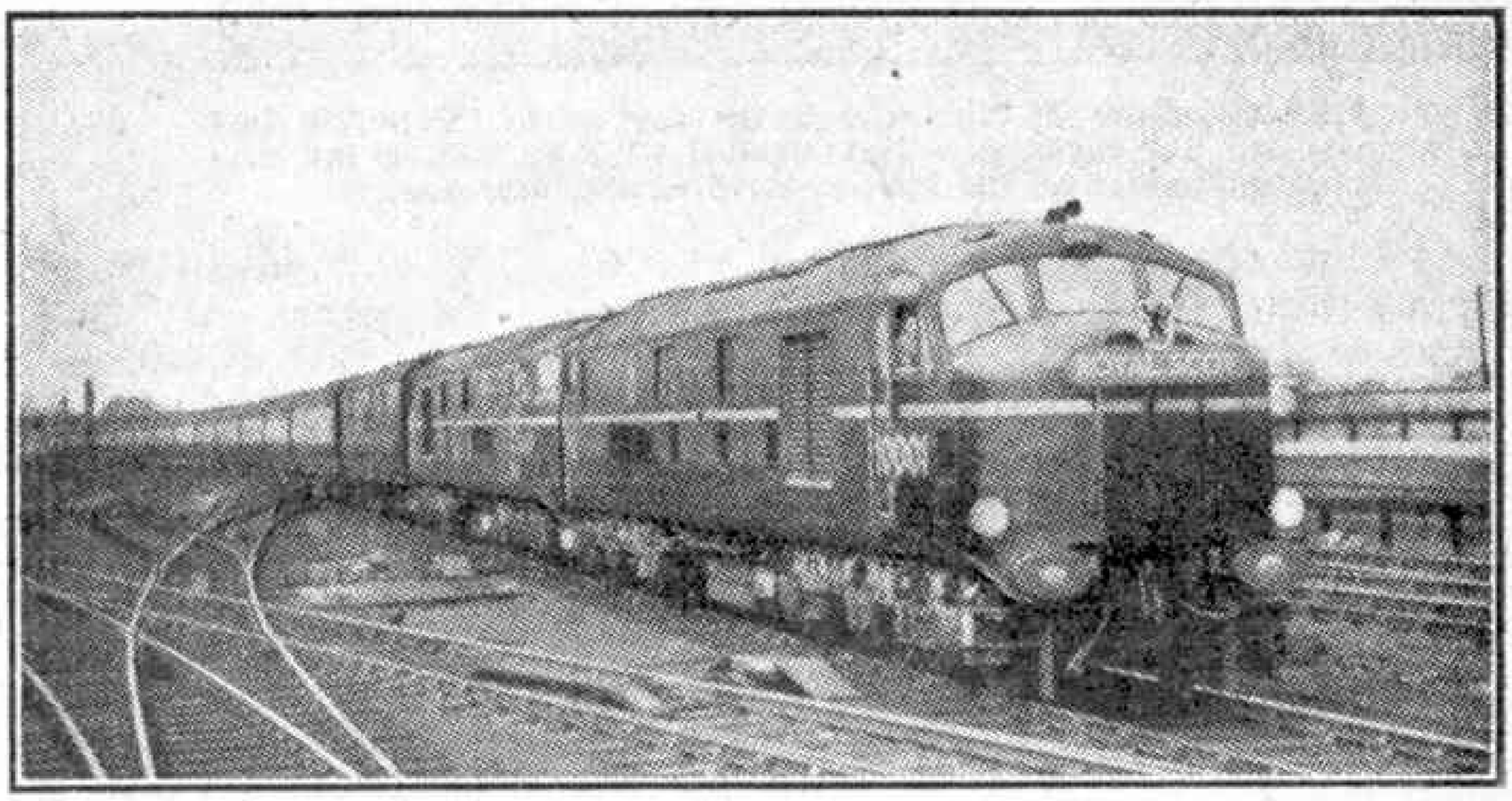
thing such a locomotive requires is to take water from the troughs.

At Whitmore during a summer weekend there is infinite interest. In addition to the large number of named trains in both directions one sees expresses for Scottish and Welsh destinations and for Blackpool, Liverpool and elsewhere. Double-heading is now far less prevalent than formerly owing to the efficiency of the rebuilt "Royal Scot," "Patriot" and "Jubilee" 4–6–0s which supplement the numerous "Pacifics." Goods trains at weekends are few and far between, the lines are far too busily occupied by expresses; but it is notable that the dear old ex-L. N. W. R. 0–8–0s seem as lively as ever, after bearing the brunt of the traffic for so many years.

Unfortunately they are now being broken up, but many still remain. But I view with the greatest disapproval their defacement by the fitting of a sort of standard L.M.S. chimney.

To reach Whitmore from Crewe by train was no easy matter; except for one train in the very early hours, there was only one other morning train from Crewe, but fortunately there was a convenient evening return. On the Saturday at Crewe I became one of a perfect army of spotters. Many of the latter will be acquainted with the overbridge at the north end of the station, apparently constructed by a benevolent railway company entirely for the convenience of enthusiastic observers. In any case it is completely adopted by them, to the detriment of any passengers wishing to use it and endeavouring with great temerity to cross it! Owing to signal posts and buildings restricting the view at the south end of the station it was found necessary to restrict photographic efforts to trains approaching from the north, where unless blocked out by rolling stock on sidings one gets a more or less clear view.

Much interest was caused by the arrival from the shed of a spotless "Royal Scot" rebuilt and repainted. This left on a Manchester train, and one can almost shed a tear on reflecting on its probable condition by the time this article was written. Later we saw rather a novelty in the shape of a Class 5 4–6–0 with a double chimney, and we had already



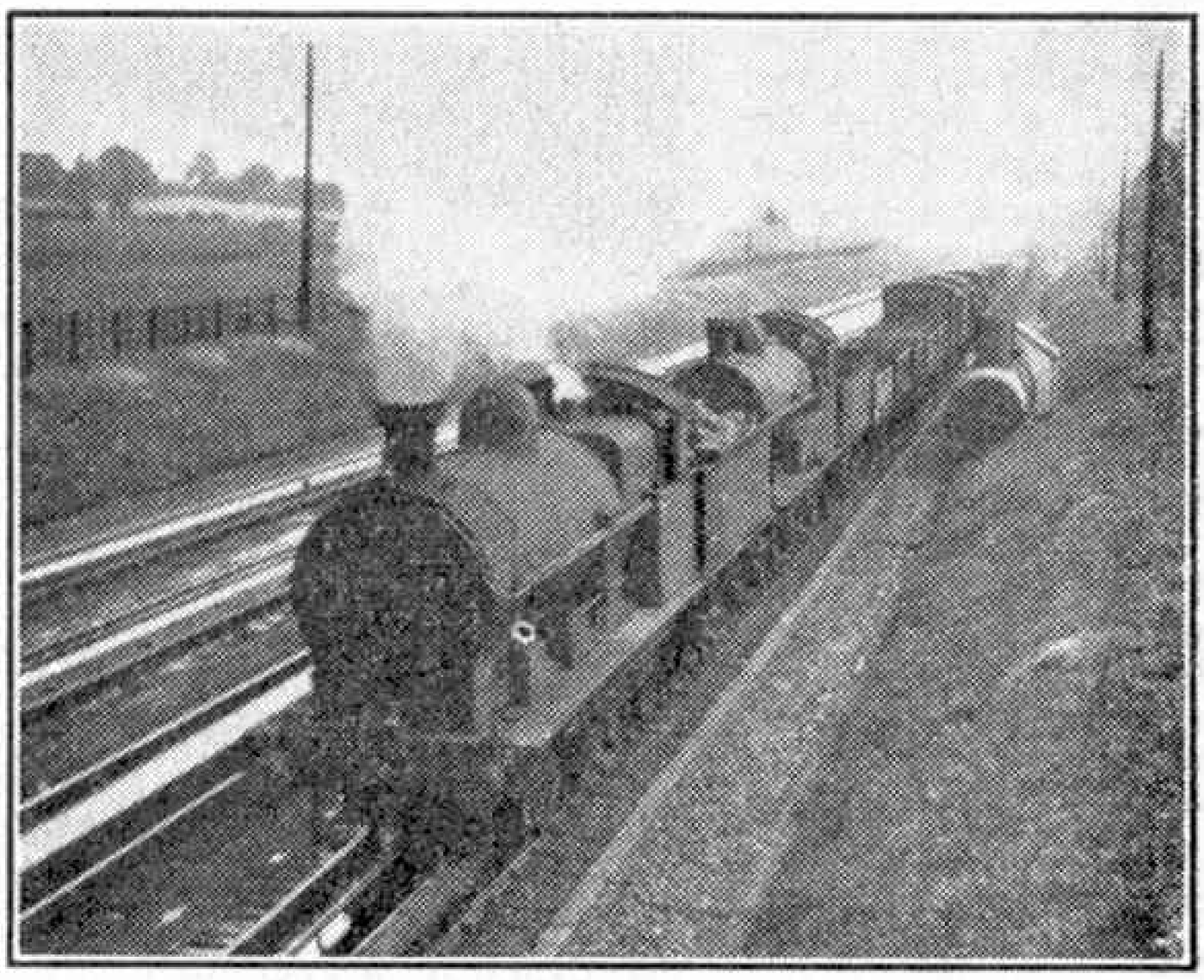
The up "Royal Scot" in charge of the diesel twins Nos. 10000-1 approaching Crewe from the north. The special "Royal Scot" headboard is prominent at the front end.

seen several of this class fitted with Caprotti valve gear. We noted that there appears to be less effort made on this Region in the direction of standardisation of painting or lettering than is the case of the other Regions. Some tenders are still lettered L.M.S., while some have the words "*British Railways*" and others the B.R. lion and wheel emblem; while "Royal Scot" and "Jubilee" 4–6–0s both rebuilt and otherwise are either black or green.

I next went to Stafford, where one can get, as at Crewe, excellent shots of up trains; but down trains must be taken from the end of the down platform owing to obstruction caused by the roof and supports, the latter being placed between the down fast and the platform roads, thus cutting out the rear of train. Here I obtained once more a nice shot of the up "*Royal Scot*," headed this time by a blue 4–6–2, "*Queen Elizabeth*." Leaving in the late afternoon I travelled to Lichfield which, boasting a very beautiful Cathedral, is a City and not a town as one might expect. As a photographic centre the low-level Trent Valley station is not at all satisfactory. It is on a curve with the light on the outside, so one is faced with the near side of the train in shadow.

Lichfield station is on the main line but the station itself is over a mile from the actual City. The high-level line crosses at right angles and runs from Derby to Walsall, but there is a small and quite unimportant service. Up trains on the main line are travelling at very high speed owing to a falling grade. Making the best of a bad job, I spent two days here during much of which I was compelled to take shelter in the waiting room from heavy rain. But I managed to obtain, among others, one more shot of the up "*Royal Scot*," again diesel-electric hauled and this time at very high speed.

This being my last port of call, photographically speaking, I got back to Euston, and there being no through train I proceeded by a "stopper" to Rugby, where I had an hour to spare; and with a thunderstorm then at its height, the camera perforce remained in its case. I therefore waited in patience for the Glasgow train at 3.1 p.m. and arrived safely at Euston. So ended a very interesting week; I had done a considerable amount of travelling and seen much of interest at a variety of important centres on the London Midland Region.



This picture taken some years ago shows one of the familiar ex-L.N.W.R. 0-8-0s at Whitmore troughs. The second engine is a "George the Fifth" 4-4-0 "Widgeon" being hauled to Crewe for scrapping.

What Is An Impact Register?

Around the yards we often hear something to this effect, "Handle her carefully, boys, there's a bug in there." Just what do they mean by a "bug"?

The so-called "bug" is known technically as an Impact Register. It is an instrument so constructed that it records the force of an impact in miles per hour and registers the exact time of impact. Several very worthwhile purposes are served by such information, among which is the placing of responsibility for rough handling with the carrier involved when shipments move over more than one line. Unsatisfactory track and yard conditions are revealed as well as improper loading methods, inadequate bracing of contents and unsuitable containers for the merchandise itself.

Many shippers now have their own impact registers and place them in cars to spot check the handling given their merchandise by various railroads over which their shipments move.

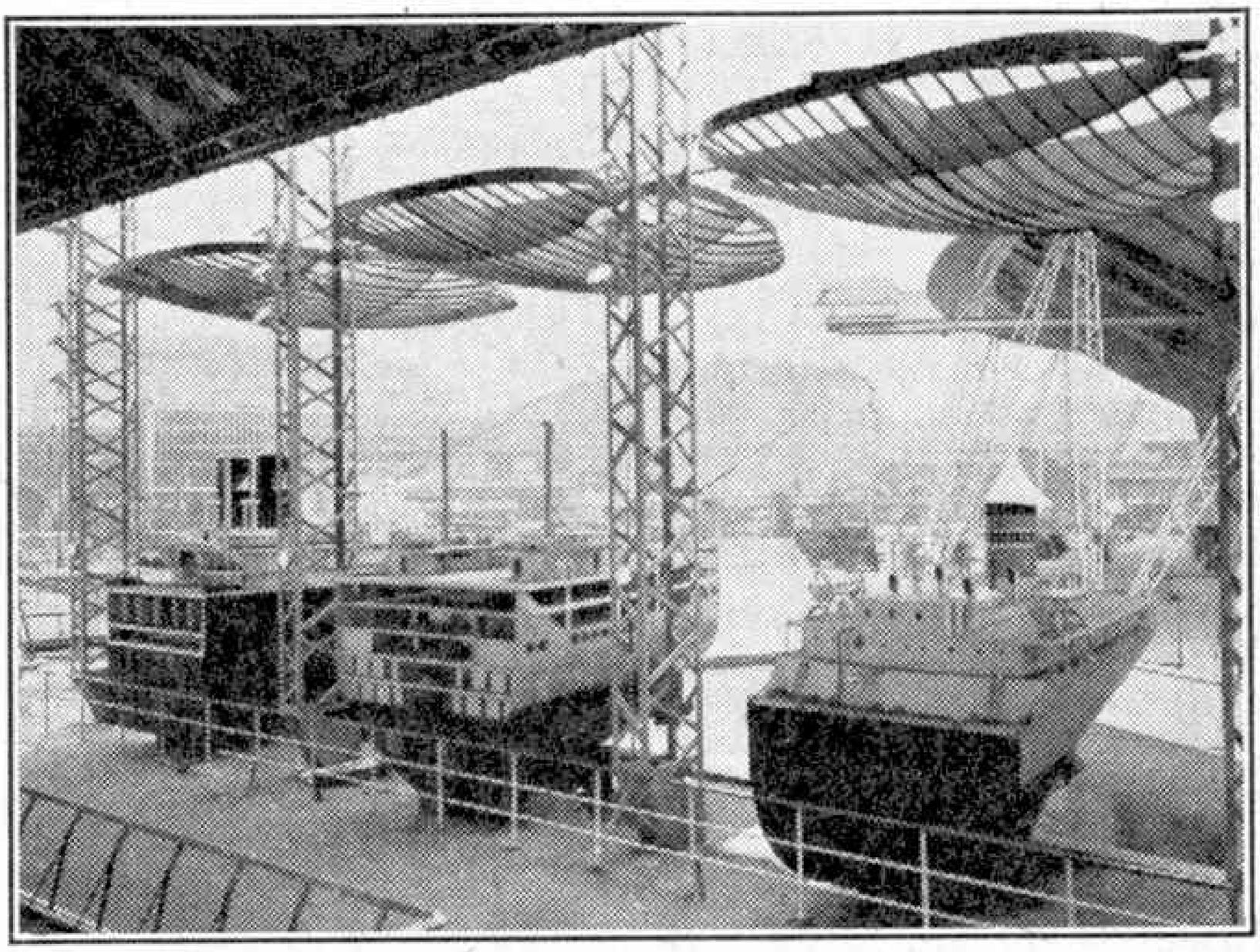
(*Reproduced by permission from "News and Views," a staff publication of the Union Pacific Railroad, U.S.A.*).

Festival of Britain Ships Section

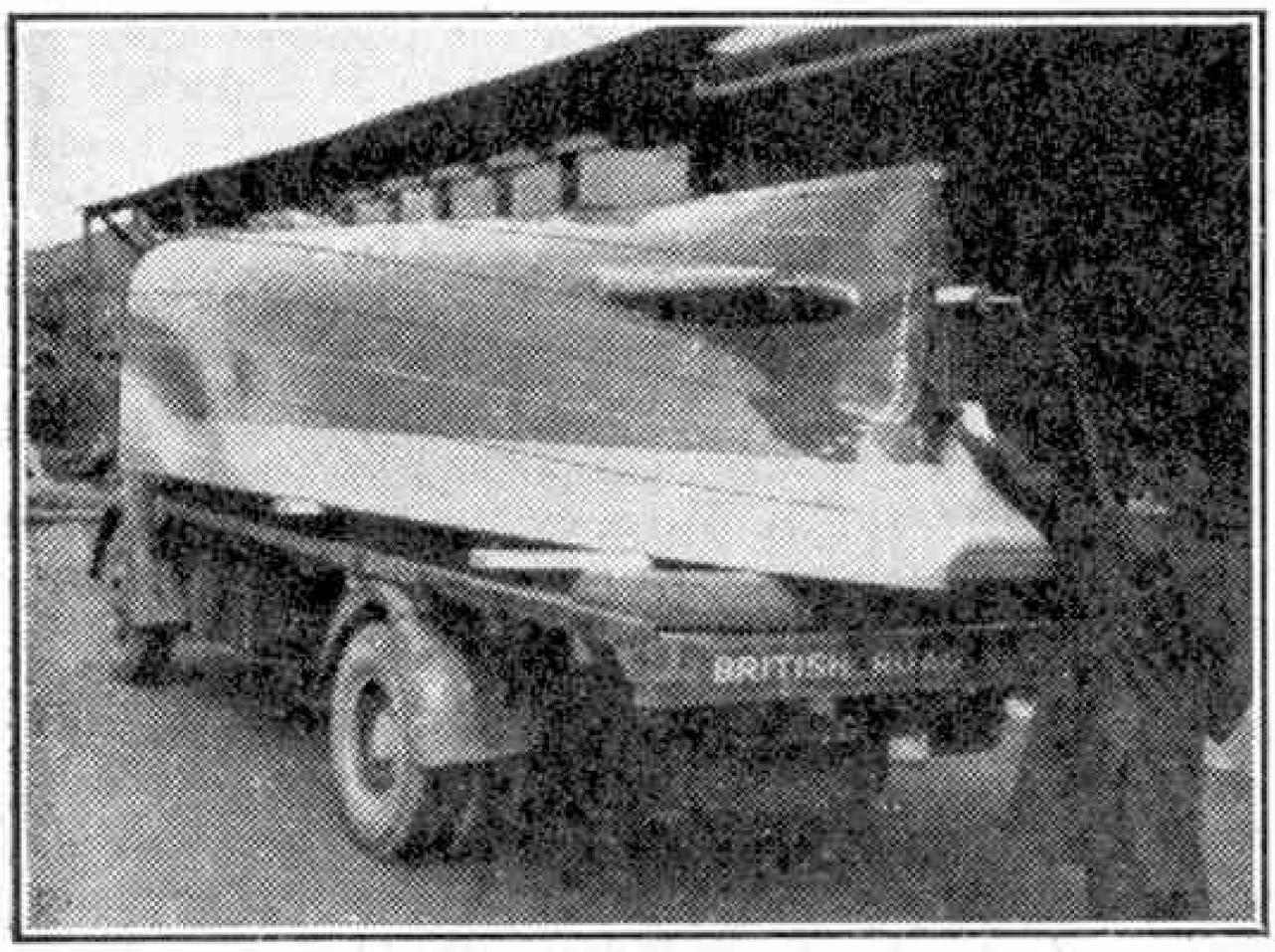
Some Fine Bassett-Lowke Models

MANY towns in England have contributed in various ways towards the Festival of Britain. Some have arranged special Festival celebrations of their own. Others have made contributions of some kind or other to the large National exhibitions, including the South Bank Exhibition in London.

The firm of Bassett-Lowke Ltd., in Northampton, well known for their exhibition display models, have built a number of remarkable marine models for the Sea and Ships Section of the South Bank Exhibition, portraying different types of modern ocean vessels. Some of these are very large indeed, one being 50 ft. long. This is a longitudinal section through a cargo vessel, one-fifth actual size, and it shows the construction of the ship, in addition to other details such as cargo stowage, etc. Another model is of a floating dock, in which will be seen a complete model of the Union-Castle liner *"Stirling Castle."* The miniature dock is some 15 ft. long, being to a smaller scale than the cargo vessel; and working model cranes will be operated on each side.



The three models of ships' sterns in position at the South Bank Exhibition, Sea and Ships Section. They are displayed over an illuminated pool. This view shows the sections through the sterns of the vessels. From left to right can be seen the whaling factory ship "Balæna," the passenger liner "Orcades," and the oil tanker.



The models of ships' sterns were so large that they had to be transported to London in sections and assembled on the Exhibition site. In this illustration the lower part of the stern of the whaling factory ship model is seen loaded, ready for despatch.

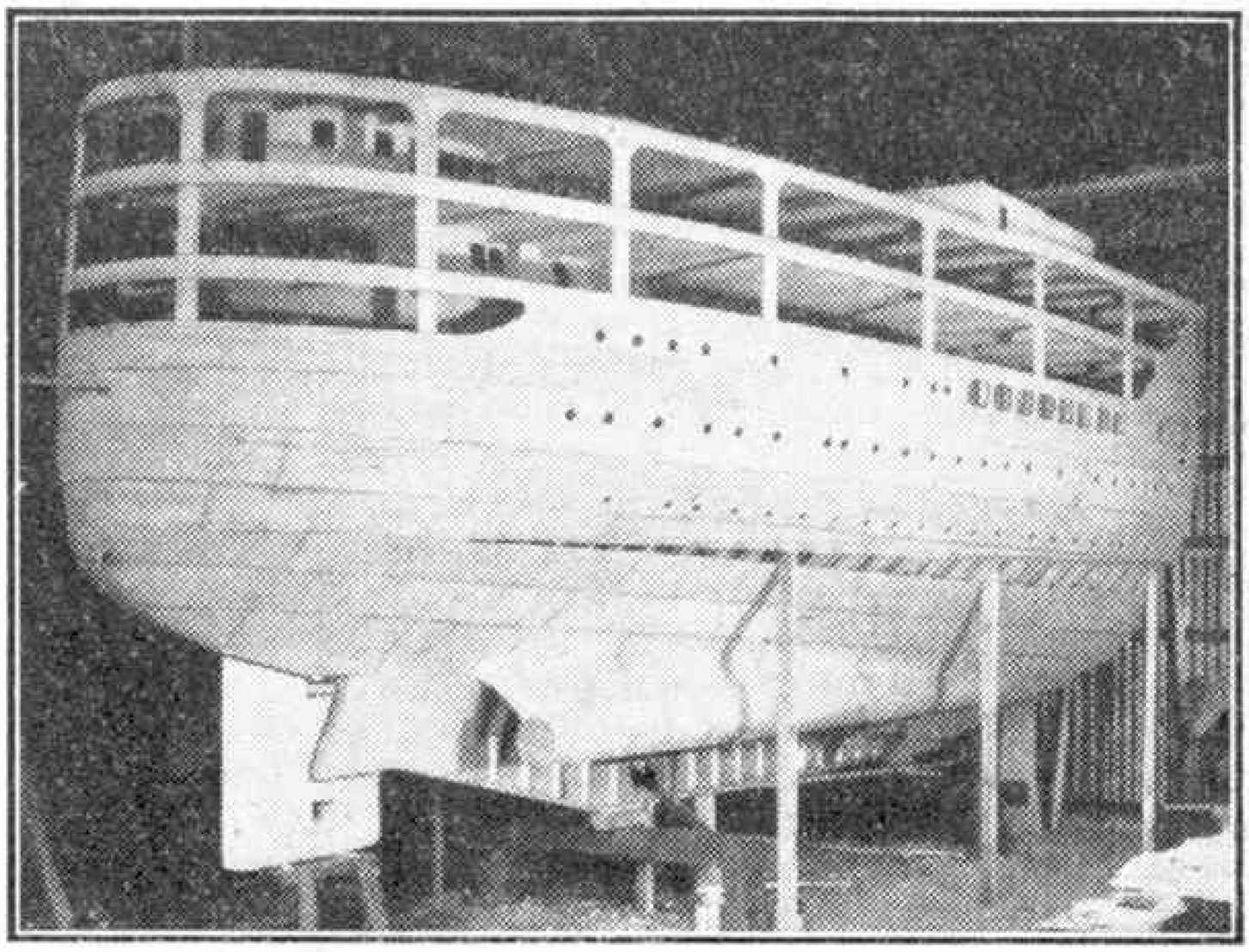
Three 20 ft. models of the stern portions of a liner, an oil tanker and a whaling factory ship are certainly most impressive. Each of the three models weighs about two tons and they are all to the same scale of $1\frac{1}{2}$ in. to 1 ft., or one-eighth actual size.

One of these stern models shows the bold outlines of the new Orient liner *"Orcades."* It is shown in section, at a point cut through the tourist entrance. It includes the very fine staircase running through three decks and also the entrance to the tourist smoke-room and lounge. On one of the decks are shown

two of the tourist class, 4-berth cabins, completely furnished in all detail.

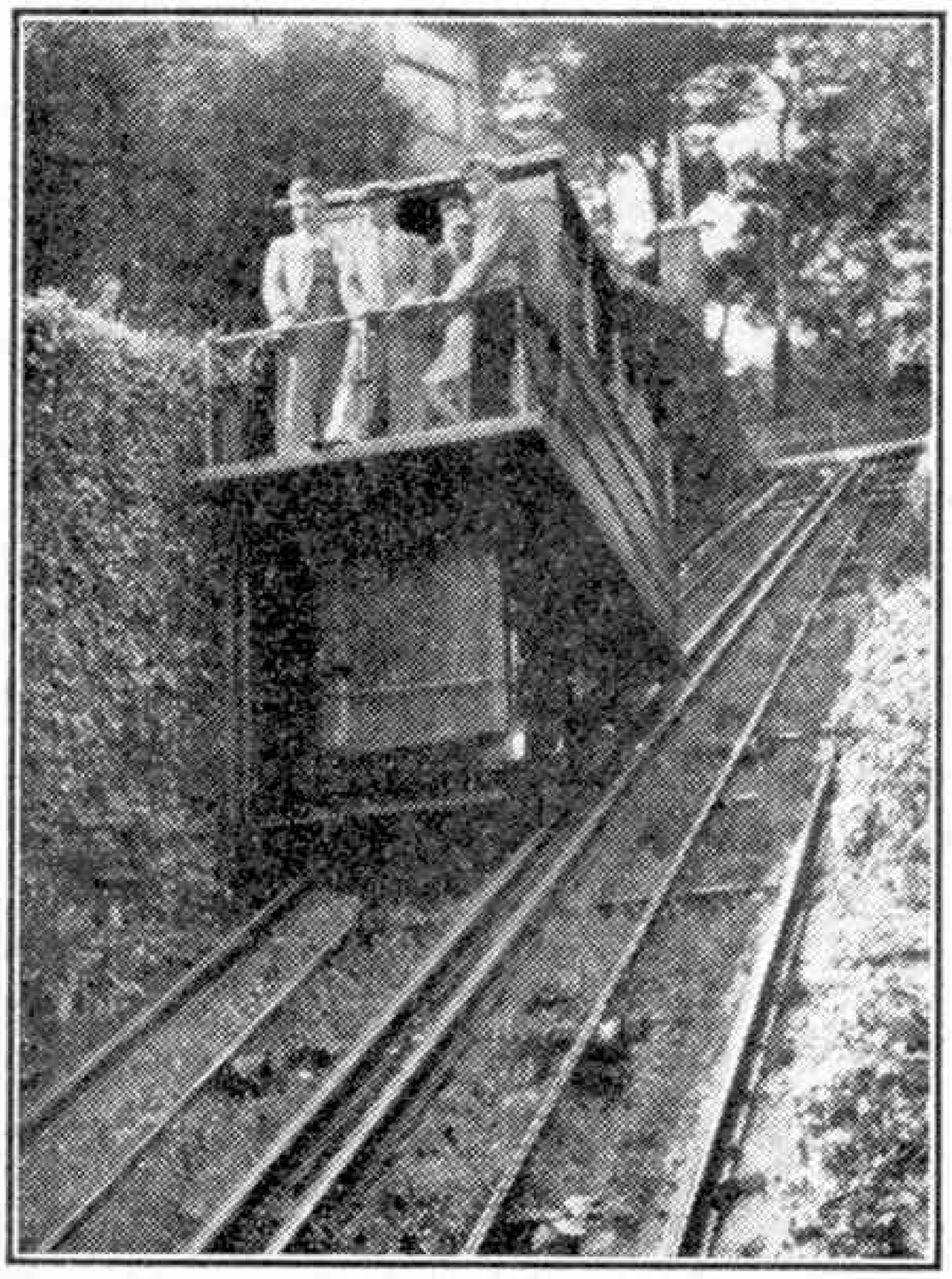
The model of the stern of the whaler displays part of the factory deck, with the boilers and machinery used for converting the raw blubber into oil.

An interesting feature also in this Marine Section is a collection of 50 waterline ship models, all to the same scale of 1/32nd in. to 1 ft. All the ships represented were built in British shipyards, ranging from the famous tea clipper *"Cutty Sark"* (1869) to the gigantic *"Queen Elizabeth"* (1940). In between come many well-known passenger liners and ships for carrying every conceivable kind of cargo. This collection has been loaned by Messrs. Wm. Harvie and Co., of Birmingham, and is part of a much larger collection of waterline ship models they have had specially made for them, over a period of years, by Bassett-Lowke Ltd.



An imposing view of the model stern of the new Orient Line ship "Orcades." The model is shown during plating process on the hull. Later, real bronze model propellers were added to the propeller shafts.

The Lynton-Lynmouth Cliff Railway



One of the cars of the Lynton-Lynmouth Cliff Railway on its way down. The cable connecting the two cars can be seen between the rails.

ON the north side of Somerset, overlooking the Bristol Channel, there are two small villages, one of which is at a far greater height than the other. Connecting these two villages is the Cliff Railway, shown in the accompanying illustration, which was opened in 1890.

The track comprises a double set of rails running down the side of the Cliff from the level of the Town Hall, Lynton, to the Esplanade, Lynmouth. The distance is 901 ft. and the gradient 1 in $1\frac{3}{4}$.

The two cars, which ascend and descend alternately, are fixed on an endless wire cable passing round a large pulley at the top. To set them in motion a ballast tank in the car at the top is filled with water, while the corresponding tank of the bottom car is emptied. When the brakes are released, the car at the top then runs down by force of gravity, pulling the car at the bottom up. Danger is reduced to a minimum by an emergency brake, which acts automatically if the cable snaps.

This idea has been extensively used in seaside and other towns where the differences of level are considerable, and the working is always of interest to visitors.

P. H. LAMB

The Cunning of the Fox

By R. H. Ferry, F.Z.S.

THE history of the British fox is perhaps more interesting than that of any other wild animal of our countryside. On reading it, one at once realises what an important part "cunning" has played in this animal's life since the earliest times.

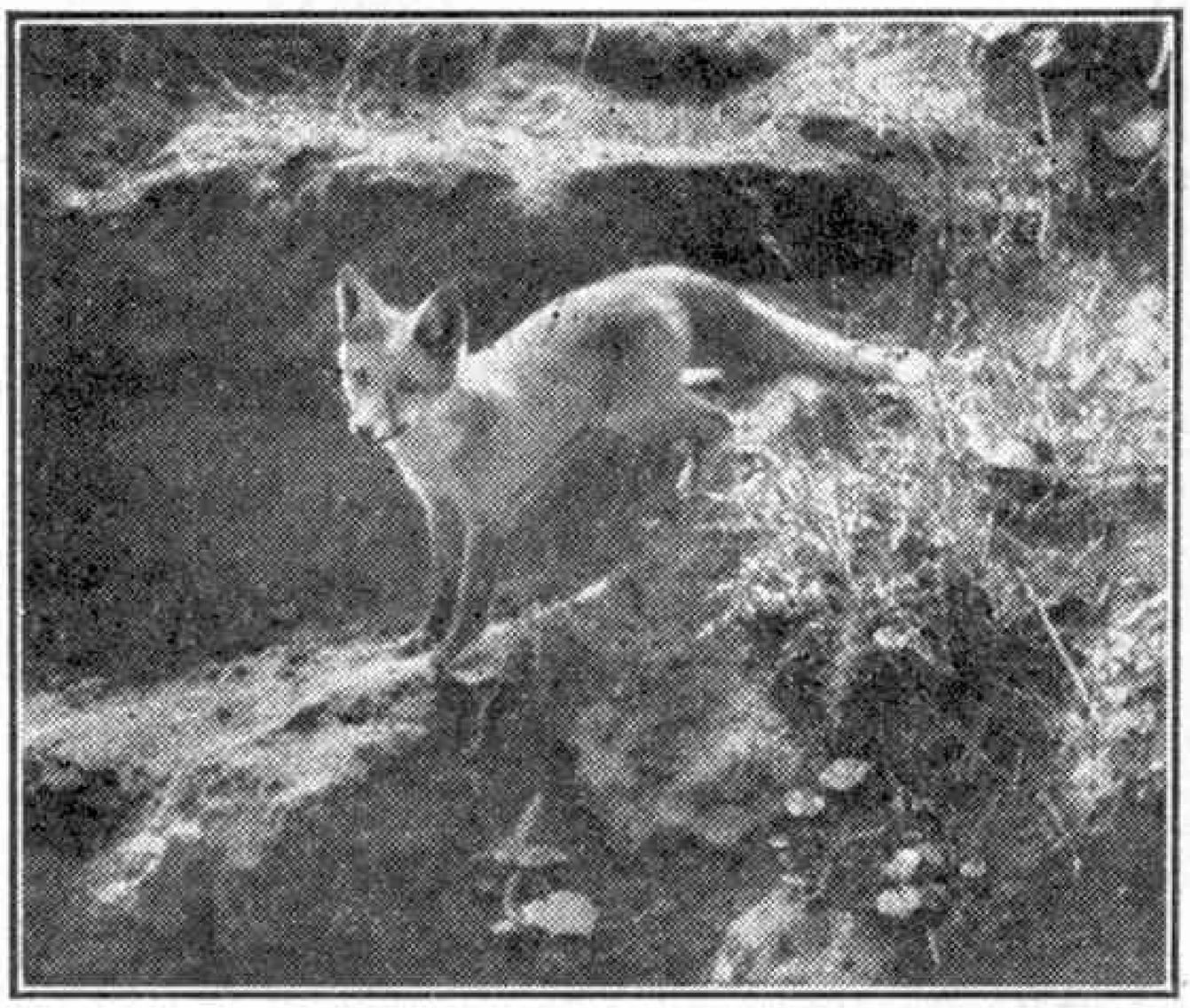
The fox in this country has not always been the gypsy roamer of our hillsides, green fields and sheltered valleys. In fact, its mode of living in the far off days of the Norman Conquest, when England was covered with great forests, was one of close seclusion. It was then classified with the lowest forms of vermin, a beast that skulked in holes in the thickest parts of the woods and rarely showed its face above ground. Undoubtedly this habit of living was forced on the fox to a great extent by the large packs of predatory and ever hungry wolves that roamed the open country and commons between the forests. Any animal that was incautious enough to come out in the daytime was at once hunted down and attacked, so to preserve its species the fox wisely stayed underground as much as possible, and we see from the first how its innate cunning was fostered and developed.

The decline of wolves owing to organised hunting led to a noticeable increase in the number of foxes—yet another case of the balance of nature being disturbed by man—but the fox continued to step warily for many years after this. Rather strangely the best records of the ups and downs of foxes in history are to be found in church parish registers. In these there are unbroken references to rewards being made for "the digging of foxes" by both men and women till as late as 1800. Then the popularity of fox hunting shows that foxes had considerably changed their habits, becoming true lovers of freedom and the more open countryside.

Far from driving foxes underground again, foxhunting seems only to have made these animals faster and more cunning than ever before. We have only to compare our lean hard-muscled British fox, a flesh eater, with the slow, fat, fruit eating "reynard" of the continent to see that our own animal is far superior in every way. The British fox, with a speed of 45 m.p.h., is as fast as a hare, and is in fact one of the speediest animals in the world. But before speed and all else in the fox's make up, its *cunning* stands out, and is proverbial; in this respect only the American coyote can compare with it.

The fox's guileful method of approaching water fowl is well known to water bailiffs and countrymen. The stalking fox goes up stream for the duck it intends killing and floats quietly down on the current with its head cunningly concealed in a tangle of weed. Another well-known wile of the fox is to lie on its back with its legs sticking up in the air. In this way it attracts the ever curious hares and rabbits within the distance of a quick leap and bound—and a fox is capable of a 20 ft. jump from a standing start! No fox is ever foolish enough to hunt rabbits or poultry in the vicinity of its earth, for fear of attracting unwelcome attention.

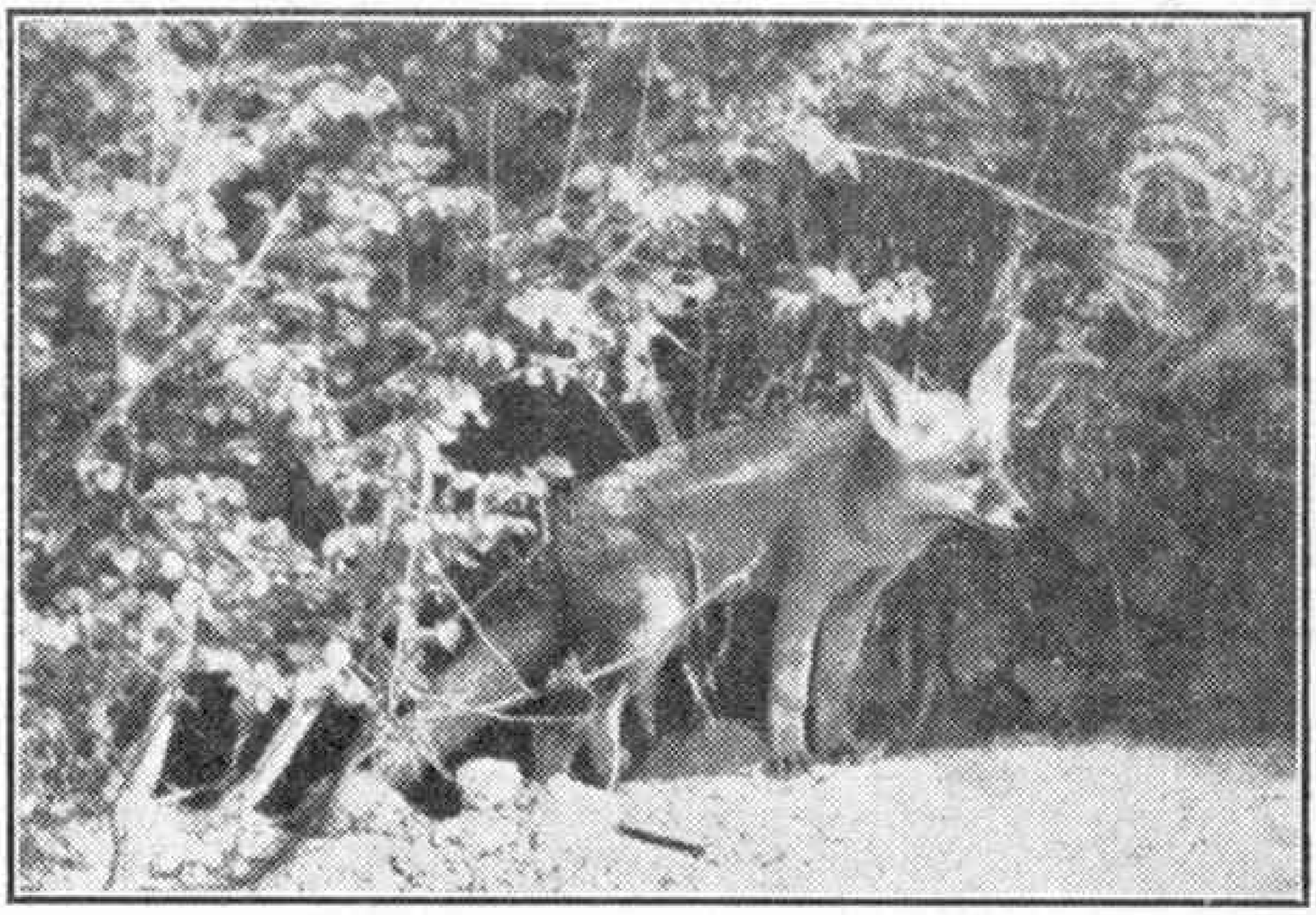
Just as he uses cunning when hunting, so he is up to every clever trick when being hunted. "Tod" knows very well that his own pungent scent is the cause of his undoing, and wherever possible he conceals it and breaks the trail by crossing running water, rolling in manure heaps or



A fox cub in a characteristically alert position. The illustrations to this article are from photographs by Oliver G. Pike.

jumping from one to another. He will also run through flocks of sheep with the same object in view, and even when the hunt is hot on his trail he will dally to start up hares from their forms in order to scatter hounds on false and diverging trails.

In the summer foxes will lie in open lairs or in the comfortable forks of trees, but in the winter through lying in an earth and underground they become very verminous. In the spring the beast often uses almost human cunning to rid itself of unwelcome visitors. Many countrymen have witnessed the fox at its "de-fleaing" and there is no question as to the authenticity of the fox technique. On its way to a river the beast collects pieces of wool from briars, or picks up a short log of wood. It enters the water slowly, hind quarters first. Gradually the body is submerged and all the vermin move hastily towards the head and neck. The verminous host then takes to its last refuge—the wool or the log. Finally the fox releases the lively mouthful and the irritating cargo floats away down stream.



A fox leaving its lair.

Many wild animals reared or brought up in captivity seem to lose much of their natural cunning, but this certainly does not apply to pet foxes, which always retain a latent wildness. Perhaps a word of warning is necessary to owners of pets. Fox cubs make interesting pets and they are easy to buy, but they should always be treated with caution as they are apt to turn treacherous suddenly, even under the kindest care.

Dumas, the French novelist, who had scores of pets at his country house, kept a dog and a fox chained up opposite each other so that he could observe their characters. One day a bone happened to be pushed into no man's land between the two kennels out of reach of both Pyramus, the dog, and Cartouche, the fox, and their master was able to see the fox outwit the dog for possession. Cartouche watched the dog straining at its chain in unsuccessful efforts to reach the prize; when the task had been given up and Pyramus had retired to sleep in his kennel, Cartouche hit on an idea to enable him to reach the bone of contention. I quote from the account by Andrew Lang in "The Animal Book." "All at once he jumped up, turned himself round when he got to the end of his fully stretched chain and reaching out with his hind leg, hooked the bone within reach!"

There is another more recent case of a chained fox using its wits in obtaining a succulent dinner. A Scots farmer was in the habit of feeding his pet fox on porridge. The fox had apparently grown tired of this and one day it scattered the porridge with

(*Continued on page 382*)

A resting fox seems to be admiring his brush.

Railway Notes

By R. A. H. Weight

Modernisation of Crewe (North) Locomotive Depot

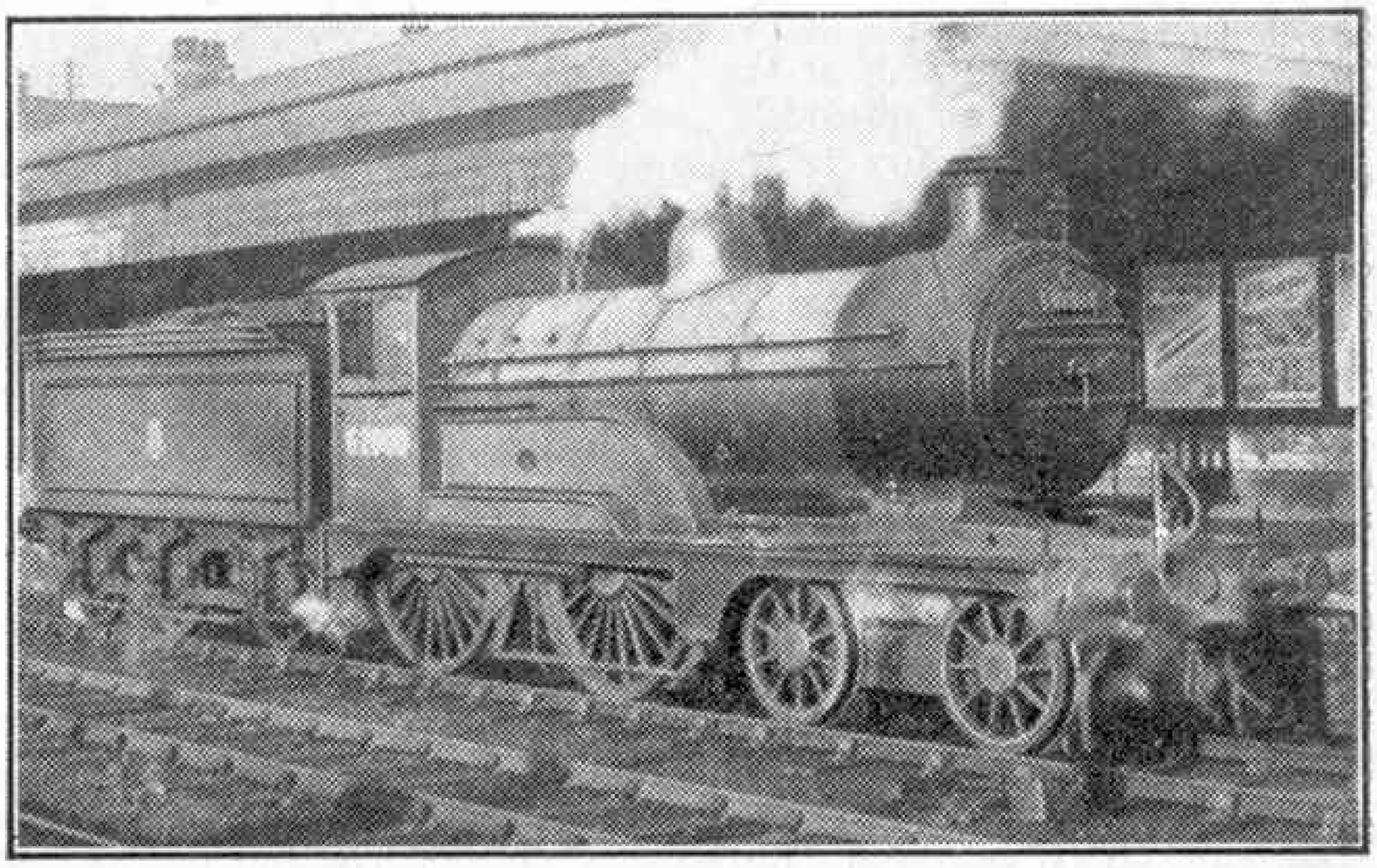
Over 90 locomotives, from 4–6–2s downward, are stationed at Crewe North, which is the largest passenger engine depot on the London Midland Region. Improved accommodation and general layout are now taking shape. We illustrate the new electrically-operated coaling plant, capable of storing 200 tons and of hoisting loaded wagons of from eight to 21 tons capacity at the rate of eight per hour. Coal can be fed at the rate of two tons per minute simultaneously to engines standing on two tracks. Automatic water sprayers prevent the emanation of dust.

The 70 ft. turntable is easily operated by the locomotive being turned through its vacuum-brake system. If an engine is "dead," the table can be driven manually by means of gears and clutch. With the aid of electric power, a most ingenious system of ash disposal is in use.

The New "Golden Arrow" Train

A handsome train of 10 new Pullman cars began running in the *de-luxe* London-Paris daily service on its journeys between Victoria and Dover on 11th June. Most of the cars were actually ordered before the outbreak of war in 1939 from the Birmingham Railway Carriage and Wagon Co. Ltd. but the work had to be suspended and was not resumed until 1949. Eight of the cars are for first-class passengers; some include a kitchen and one of the parlour cars contains a delightfully appointed "Trianon Bar." The windows, lighting and ventilation present some entirely new features. Each car has a different colour scheme of interior panelling and finish, with fawn carpets laid on rubber underlay, also newly-upholstered chairs. The train is equipped throughout with a public address system so that announcements can be made at any time. Calor gas is used for cooking. The gas cylinders are lodged in steel boxes mounted beneath the underframes of the kitchen cars. The exterior finish of the cars displays the standard Pullman colours of cream and umber.

The first-class cars are named "*Minerva*," "*Aquila*," "*Cygnus*," "*Pegasus*," "*Hercules*," "*Orion*," "*Perseus*," and "*Carina*." Two second-class cars numbered 35 and 208 respectively complete the make-up, together with the trucks carrying the through baggage containers. At the head is usually one of the blue "Merchant Navy" locomotives stationed at Stewarts Lane, London. At the time of writing, No. 35027, "*Port Line*" appeared to have been regularly engaged in hauling the "*Golden Arrow*" each way for some weeks or more.



No. 62000 an Ivatt 4-4-0 of the former G.N.R. as rebuilt with side-window cab for official inspection trains and other V.I.P. duties. Photograph by W. S. Garth.

Exhibition and B.R. Locomotive News

Nos. 70008–9 of the "Britannia" 4–6–2 class begin the series officially allocated to Norwich, following on Nos. 70000–7 at Stratford. Several of them have been temporarily detached for exhibition or trial purposes elsewhere. No. 70005, "*John Milton*" has been undergoing thorough trials on the Rugby Testing Plant and was expected to make test runs over the Leeds-Carlisle line. No. 70009, "*Alfred the Great*" has been tried on heavy express runs between Euston and Rugby, afterwards transferring to Nine Elms for a period of express running on Bournemouth and West of England services to and from Waterloo, where she was to be joined by a later engine of the same class. One of those now being completed was also intended to be stationed at Camden for trial on Euston-Liverpool or other L.M.R. long-mileage turns.

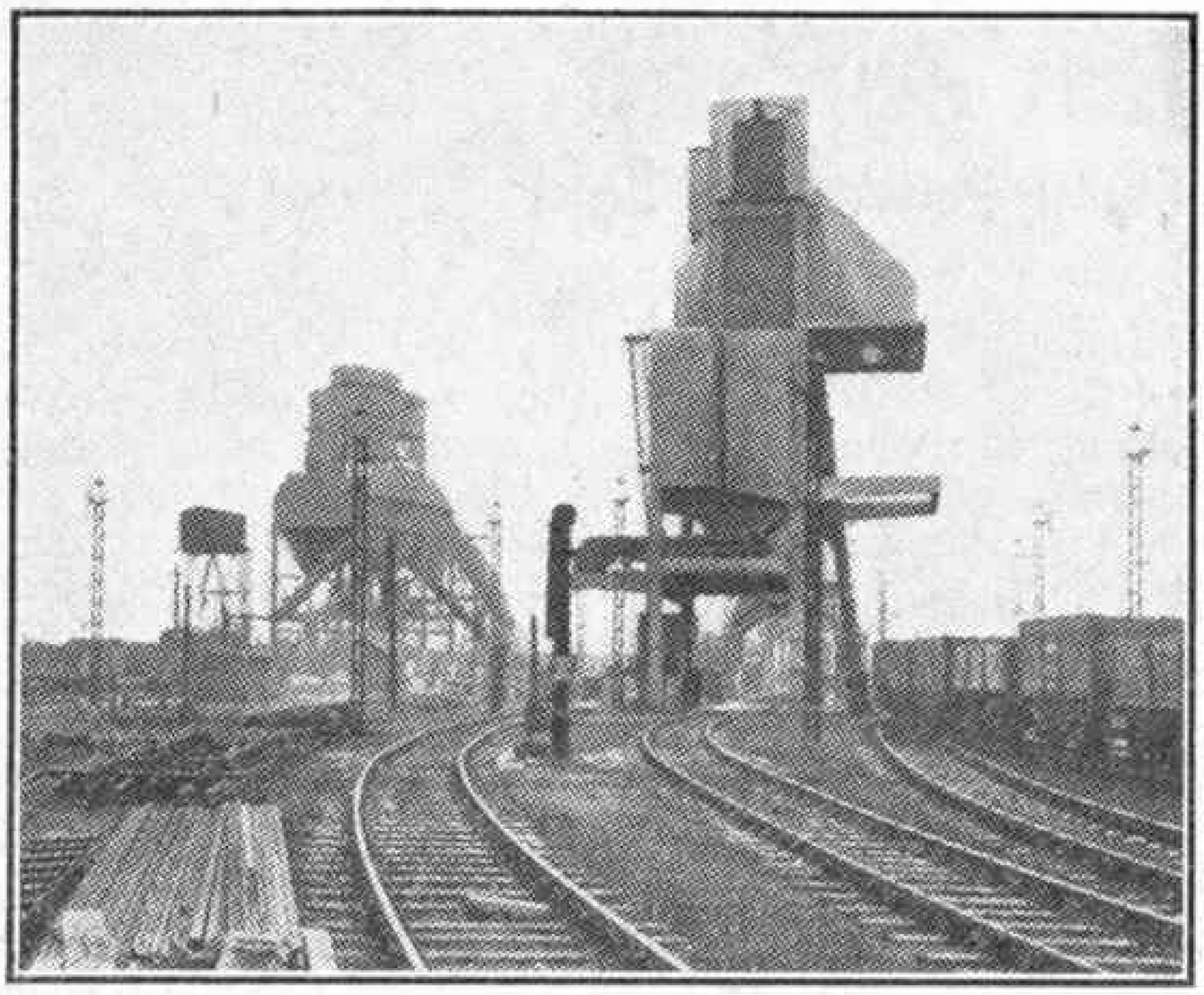
"*Britannia*" worked down from King's Cross to York at the end of May, in connection, it was understood, with a Festival of Britain exhibition in the north. We hope to include a short description of dynamometer car and Rugby Plant tests with two of these engines next month.

No. 75000, the first of the B.R. standard class "4" 4–6–0s, similar to the class "5" 73000 type recently described but smaller as regards driving wheel diameter and certain other dimensions, was completed in time for inclusion in a fine exhibition of locomotives and rolling stock at Eastbourne on 2nd June. This was held to coincide with the opening of the International Railway Congress. Class "5" No. 73001 was also at Eastbourne, together with 4–6–2 "*Alfred the Great*"; the "Fell" diesel-mechanical 4–8–4, No. 10100; diesel-electric 0–6–0 shunter, 15227, lately completed at Ashford; S.R. electric main line engine No. 20003; as well as examples of new rolling stock, track, signals and wagons.

Scottish Tidings

In April last a special train run for members of the Stephenson Locomotive Society and their friends, formed of four L.M.S. corridor coaches, started from South Queensferry and traversed a 43-mile route in the Edinburgh district largely along lines not usually used for passenger traffic. It was hauled by No. 62471, "*Glen Falloch*" of the former North British "Glen" 4–4–0 class, looking very smart in lined black. Stops were made for photographic and sightseeing purposes at various points. The route included the Glencorse branch and surburban or goods tracks and a section of the oldest passenger railway in Scotland.

No. 62451, just withdrawn, was the last survivor of L.N.E.R. class "D32." It began as N.B.R. No. 890 in 1907, being one of the "Intermediate" 4–4–0 series with 6 ft. driving wheels, as have the "Glens" mentioned above, though the latter are larger and more modern engines. More "V2" 2–6–2s have been allocated to 64A, St. Margaret's shed, Edinburgh. Interesting interchanges of engines continue between



The modern ferro-concrete coaling stage provided as part of the modernisation at Crewe North. The old coaling stage, the first in the country in 1911, is seen in the background. British Railways Official Photograph.

former L.M.S. and L.N.E.R. sheds or routes. At Waverley, a train of L.N.E.R. coaches was noted entering from the west headed by two class "5" L.M.R. 4–6–0s; a "V1" 2–6–2T, in spotless, polished condition, was there, still carrying L.N.E.R. number 7670, but no number at all on smoke-box or buffer beam. "Scott" and "Shire" 4–4–0s were about, as well as the now ubiquitous "B1s" which appear at various former L.M.S. stations.

Several Compound 4–4–0s were recently stored at Ayr, Ladyburn and Greenock. New class "5" 4–6–0 No. 73000 is allocated to 63A, Perth, but has been on loan to Derby Shed.

Summer Accelerations

In consequence of freight congestion and staff shortage in some areas, the introduction of the B.R. summer timetables was postponed for a fortnight. It is gratifying to note that faster timings have been applied to a number of main line services, so that it is possible, for example, to reach Liverpool Manchester, Leeds, York, Edinburgh, Birmingham, Norwich, from London, more quickly than at any time since 1939.

G.N.R. (I) Summer Services

The G.N.R. (I) Summer Timetable, in operation since 17th June, shows increased diesel train services between Dublin and Belfast in accordance with the company's policy of "*Shorter trains and more of them.*" As anticipated in the June "*Editorial*," the "*Enterprise*" service between Belfast and Cork, suspended since 17th March last, also is restored. Nearly one-third of the total daily booked passenger train mileage is run by railcars or rail buses. A new diesel train seating over 200 passengers leaves Dublin each weekday at 12 noon and runs non-stop to Belfast, arriving at 2.30 p.m. The return non-stop train leaves Belfast at 4.50 p.m. following the 4.45 p.m. Dublin "*Enterprise*" closely, and arriving in Dublin at 7.20 p.m. Buffet meals are served in these trains.

The "*Bundoran Express*" from Dublin began running on 1st June. A through carriage from Belfast is now attached to the 11.15 a.m. Derry Express for Bundoran via Omagh, and the corresponding return is by 12.10 p.m. ex Bundoran via Clones. Local services on weekdays and Sundays between Dublin and the surrounding seaside resorts are increased, also those between Belfast, Warrenpoint and Newcastle, for both day and afternoon excursionists.

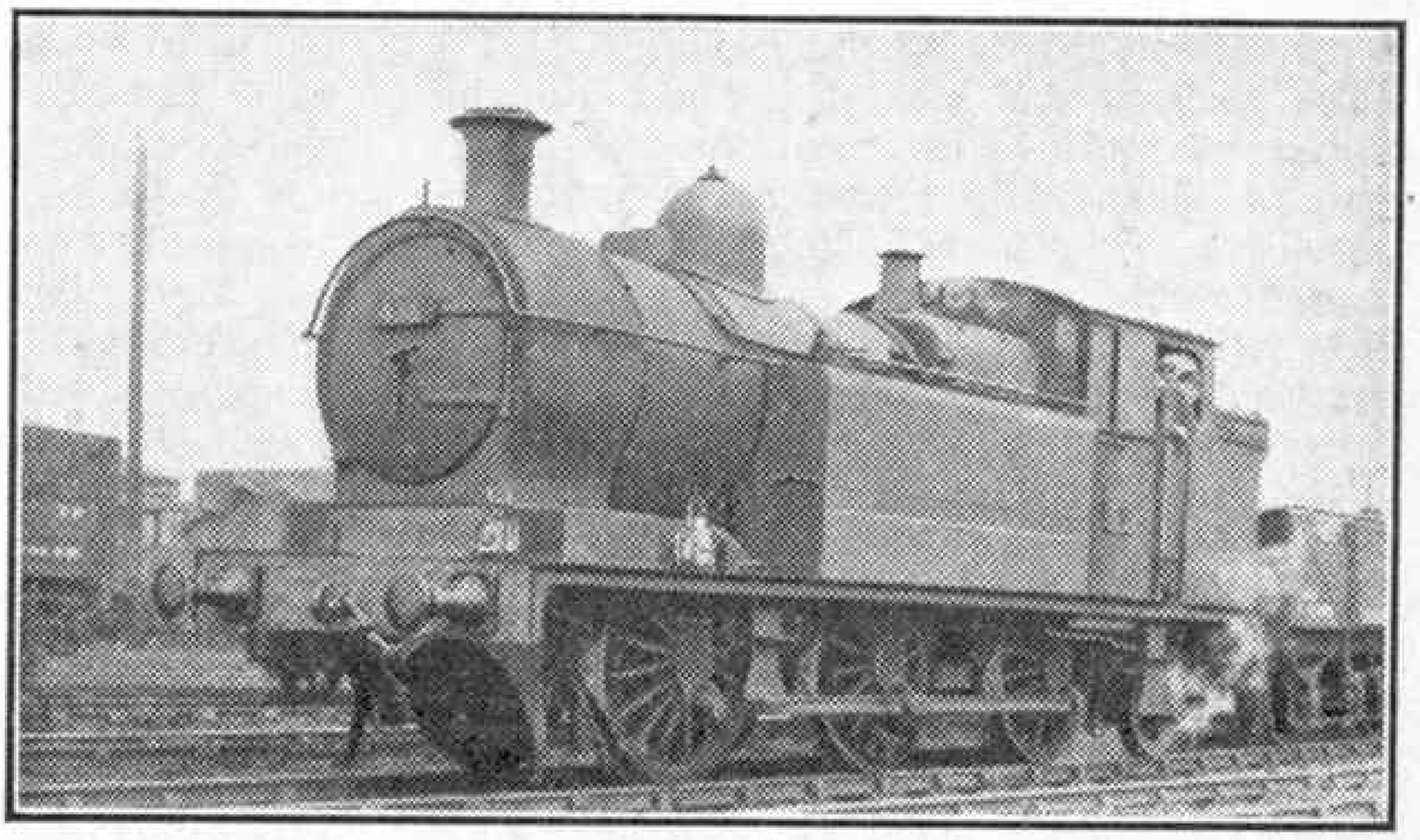
The Last "Hughes" 4-6-0

On 1st July a railway enthusiasts' L.M.R. excursion from Lancashire towns to York Railway Museum was by special arrangement hauled by No. 50455, the last of the 75 Lancashire and Yorkshire type "Hughes" 4–6–0 locomotives in service.

B.R. Wagon Initials

The inclusion of the British Railways "E" and "B" wagon number prefix initials in a recent "*M.M.*" competition raises two interesting points. "E" is officially translated as "Eastern Group" not "Eastern Region," since it covers both E. and N.E. Regions, which pool their affairs to much the same extent as they did under the L.N.E.R. There are actually no standard wagon types as yet, though some new regional designs have appeared, such as the S.R. type steel vans, and others have been built by more than one region. The "B" lettering is in fact applied to all new construction from the 1950 programme onward, and can be seen on many well-tried regional designs.

Open wagons are numbered from 400000, vans from 700000, perishable vans and cattle wagons from 800000; flat, bolster and well wagons from 900000, brake vans from 950000; and service wagons prefixed "DB" for "*Departmental British*" from 980000. The numbers below 400000 are allotted to high-sided mineral wagons, including the ex Ministry of Transport stock, the numbers of which are thus unchanged. There are also 9,200 French-built steel open wagons of standard S.N.C.F. design, numbered B. 190000 upward, bought last year to meet the heavy deteriorations of ex-private owner stock.



An interesting South Wales locomotive at Newport ,W.R. No. 436. It was originally a Brecon and Merthyr engine, but is shown with a Rhymney boiler, Swindon fittings, and side tanks as used on the former Taff Vale. Photograph by J. N. Westwood.

Veteran Aircraft

Relics of Early Powered Flight

By John W. R. Taylor

NEAR the pretty little village of Old Warden in Bedfordshire is one of the most interesting aerodromes in Britain. From the narrow, dusty road that winds past, it looks little different from scores of other private airfields. One or two light 'planes are usually parked on a concrete patch in front of the small sheds which cluster in one corner of a large paddock; in the opposite corner a large orange wind-sock billows gamely in the breeze. But there familiarity ends. Inside the main hangar one is no longer in an age of jets and comfortable enclosed cockpits, for this is the home of the Shuttleworth Collection of veteran aircraft, some of which date back to the earliest days of powered flight.

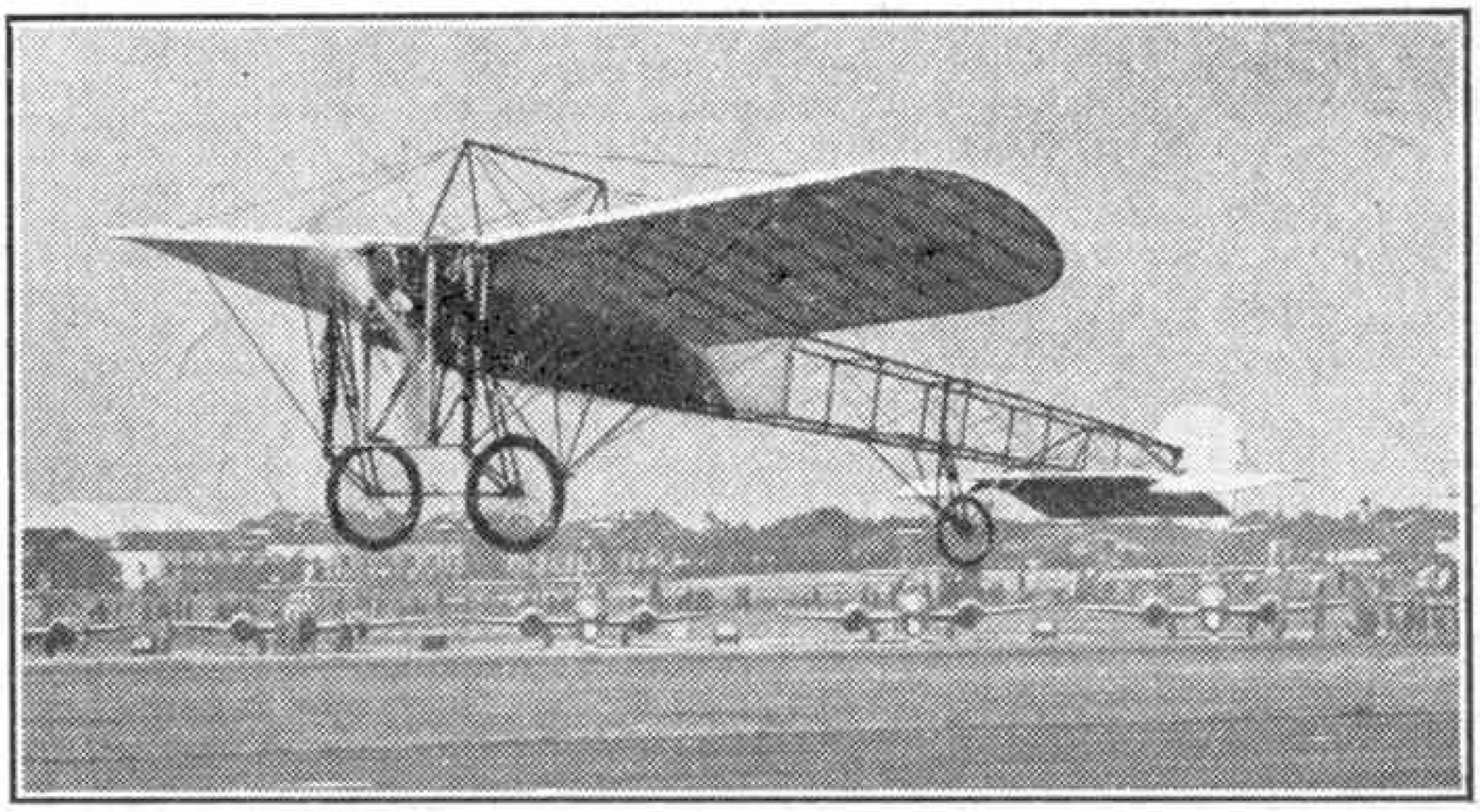
The story of how the Collection came to be formed begins half a century before even these aeroplanes were built, when a clever British engineer invented a device which brought improved efficiency to our railways and a large fortune to himself. Most of the money—something like a million-and-a-half pounds—eventually found its way to the engineer's grandson, Richard Ormonde Shuttleworth, who was also, fortunately, endowed with a lot of common sense, outstanding engineering ability and terrific enthusiasm for anything mechanical.

The major part of his heritage comprised the Old Warden Estate, covering some 9,000 acres of rich farmland; and his interests were divided between farming, motor racing and his collection of historical vehicles. These covered every form of transport, including bicycles and horse-drawn carriages; but he derived most pleasure from buying early motor cars, taking them to pieces and making them work.

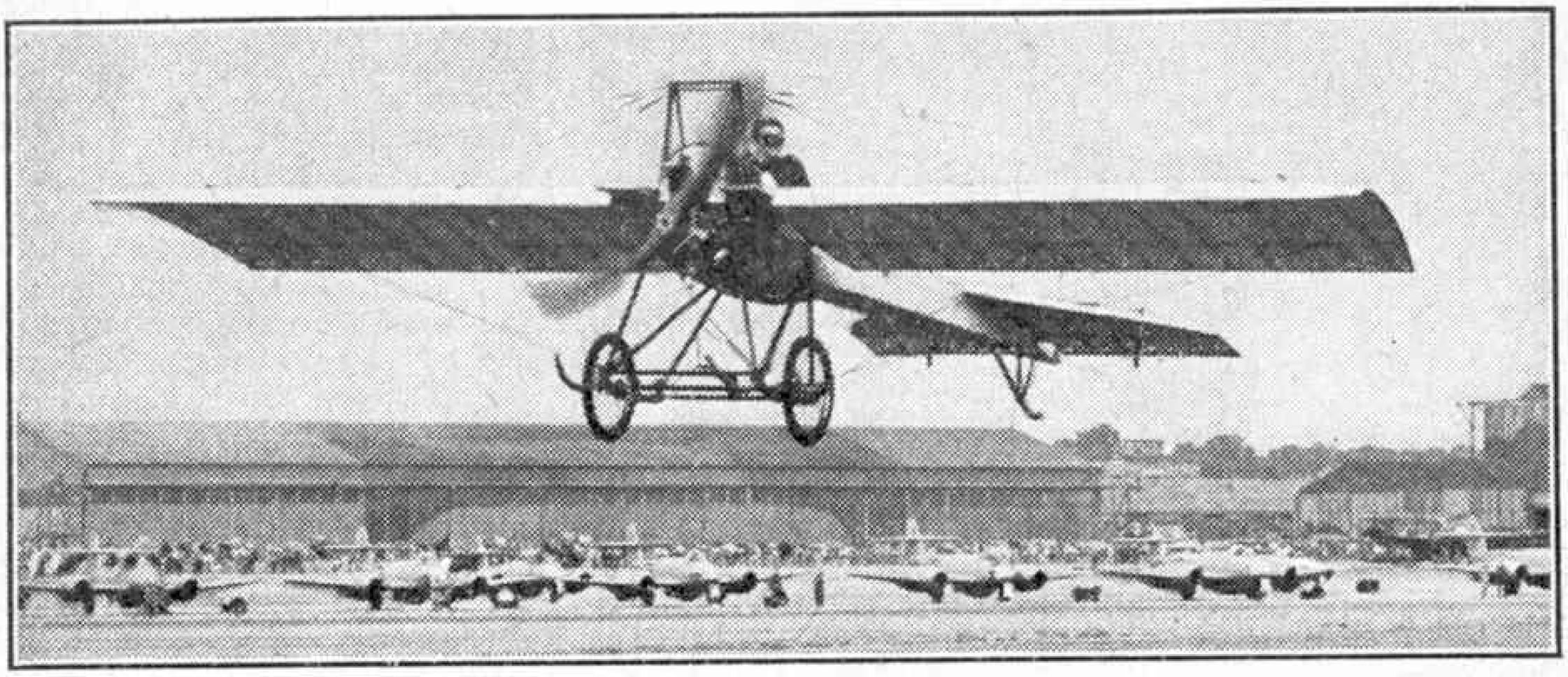
Then, in about 1931, Richard Shuttleworth learned to fly, and from that moment aviation seems to have taken first place in his life. It is not hard to imagine his excitement when, a couple of years later, a garage-owner offered him an old Bleriot monoplane and a 1911 Deperdussin for his museum; the only conditions being that he gave them a good home and cleared out at the same time an adjoining shed which was crammed to the roof with empty oil drums.

With the help of his friend, A. H. Wheeler, now Air Officer Commanding R.A.F. Units in Cyprus, Shuttleworth first dealt with the oil drums and then collected the aircraft. The Deperdussin presented few problems, as it had been stored more or less in one piece, except for its wings; but the Bleriot had been sawn in half and removal of its back end from a scrap heap involved cutting down a 20 ft. high tree.

Anybody but Shuttleworth would probably have boggled at the thought of trying to get that Bleriot airworthy, especially as he decided from the start that no modifications or improvements to the original design would be allowed, no matter how attractive they might seem. When rebuilt, all his vehicles had to be *exactly* as they were when they left the factory a generation earlier. This was not too difficult in the case of ancient motor



The 1910 Bleriot at the 1950 R.A.F. Display, Farnborough. It is flying over a row of Gloster "Meteor" jet fighters. Photograph "Flight" copyright.

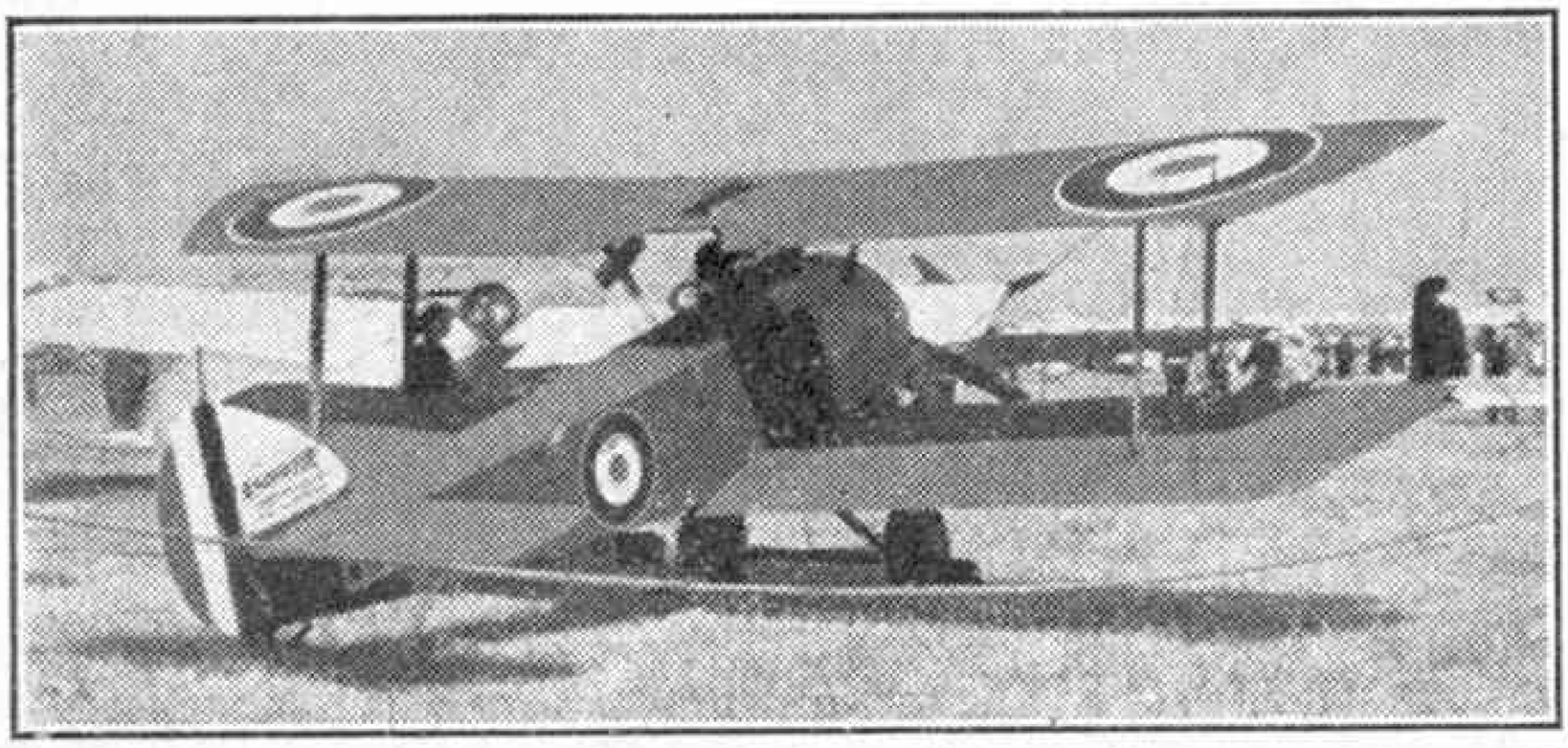


Shuttleworth's 1911 Deperdussin Monoplane flying over the "Me'eor" jet fighters a the Farnborough display. Photograph "Flight" copyright.

cars, where the consequences of a mudguard dropping off were unlikely to be serious. Aircraft were a rather different proposition. Even if some of the original drawings or photographs were available, their owners had often altered the airframes to their own ideas in an effort to improve performance, and the results of a tailplane coming adrift in full flight, even at a height of 20 ft. above the ground, would be most unfortunate.

Nevertheless, both the Bleriot and the "Dep." were rebuilt and flown, followed by a 1916 Sopwith "Pup," 1917 Hanriot fighter biplane and a Blackburn Monoplane of 1912. The story of the Blackburn is typical. Its original owner was a young farmer named Montague Glew, who used it to gain his Pilot's Licence No. 410 on February 4th, 1913. All went well until, some months later, Mr. Glew made a heavy landing, smashed the undercarriage and considerably bent the rest of the aircraft. Deciding, apparently, that there was more future in farming, he simply lifted the remains just as they were and dumped them in a convenient barn, where they remained until salvaged for the Shuttleworth Collection. As a point of interest, not all the bits were in the barn, and some missing components were found eventually under a haystack.

Rebuilding went fairly well according to plan until the Blackburn was nearly ready for flight, when its centre of gravity was found to be in the wrong place, so that it could not possibly fly. Mystified, the Shuttleworth engineers carefully scaled up old photographs in early issues of *"Flight"* and *"The Aeroplane,"* and discovered that for some reason or other 18 in. of the fuselage had been sawn off and removed without trace from between the engine and the cockpit. After the missing section had been replaced and the aircraft's 50 h.p. Gnome engine rebuilt and tested, there was no longer any doubt of the aircraft's airworthiness, as anybody who saw its fine circular flight at this year's Royal Aeronautical Society's Garden Party will testify.



The Shuttleworth Sopwith "Pup"—still fully aerobatic after 35 years. Photograph by J. W. R. Taylor.

The Hanriot Biplane was a familiar sight at pre-war flying displays, until one day in 1938 somebody took out the pin which held one of its wheels on and forgot to replace it. As a result, when Richard Shuttleworth took

The Blackburn Monoplane after write-off by Mr. Montague Glew in 1913. This is what it looked like when Shuttleworths collected it!

off from Brooklands the whole aircraft left the ground with the exception of one wheel, which continued to roll across the aerodrome. On landing at Old Warden, the Hanriot promptly turned upside down and was damaged beyond economical repair.

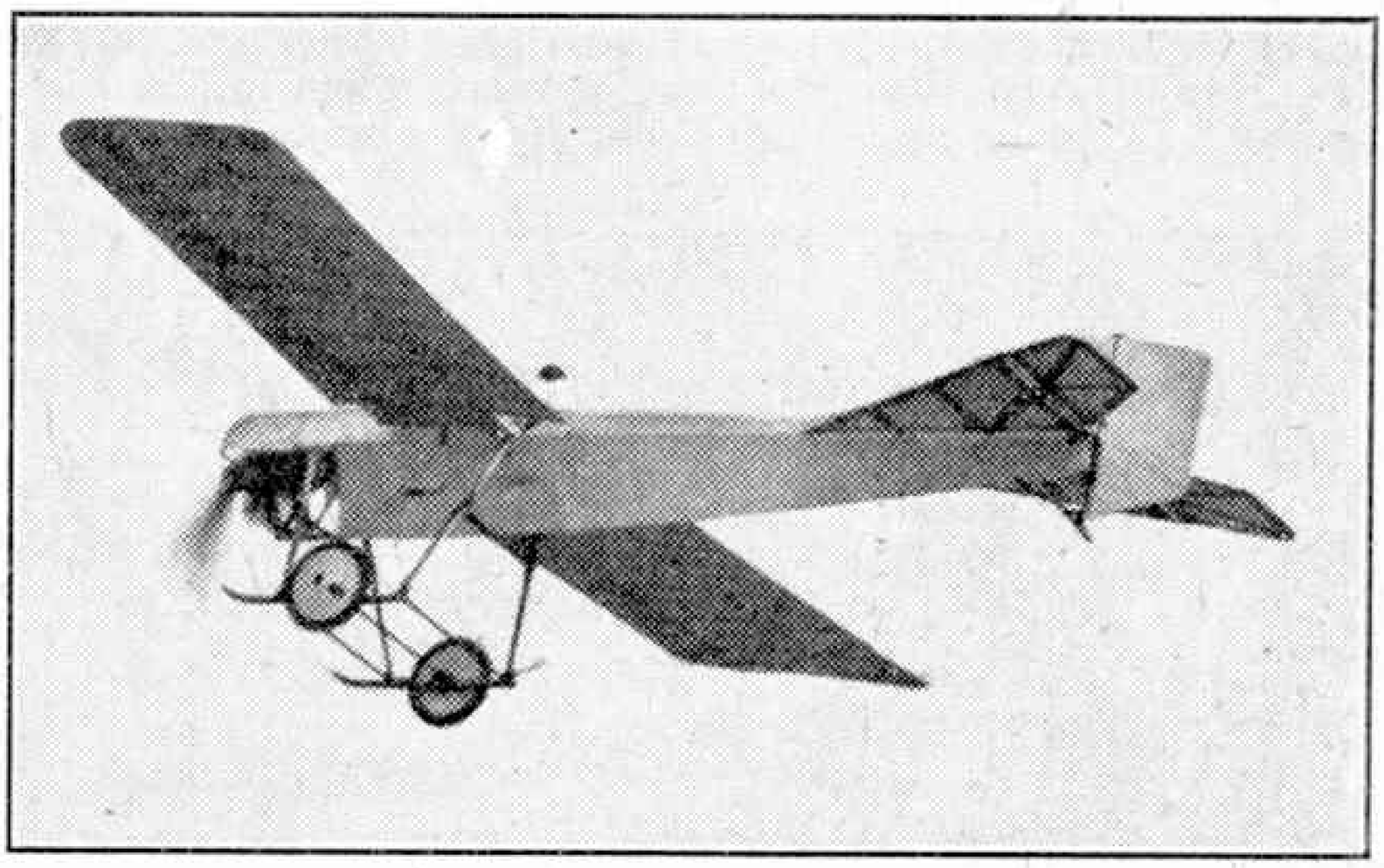
When war broke out two years later Richard Shuttleworth joined the Royal Air Force as a pilot, and was killed in 1940.

His mother decided to put aside most of his fortune as a Remembrance Trust, to give other boys a chance to learn and enjoy the arts of aviation and farming. Most of the available money has so far had to be used to get the Agricultural College started; but the aviation side has kept going by taking outside work such as aircraft overhauls. As a result, it now has five airworthy veterans—the Bleriot, Deperdussin and Blackburn, a Sopwith "Pup" and a Bristol Fighter. In addition, it has an S.E.5 fighter and Bat "Bantam," which will be rebuilt as soon as more cash becomes available.

Getting these old machines into the air again after 30 or 40 years can easily cost up to £1,200, half of this for the engine. So it is not hard to imagine the Trust's gratitude for gestures such as that by Bristol and Rolls-Royce, who recently rebuilt the Bristol Fighter and its "Falcon" engine at no cost to the Trust. It also explains why the Trust are particularly anxious to obtain old aero engines, or even bits of engine which can be reconditioned to keep its aircraft flying and reduce costs.

That all this effort is worthwhile is beyond dispute, for the sight of the Bleriot hopping across the airfield at Farnborough during last year's R.A.F. Display, or of the aggressive little "Pup" looping the loop despite its 35 years, gives us a far better idea of the courage and skill of aviation's pioneers than all the Museum exhibits in the world.

There is, however, one veteran aeroplane in the Collection that will probably defy the ability of even the Shuttleworth engineers to get it airborne. At the moment it is little more than a pile of rust and dry rot, but was once a magnificent steam-driven ornithopter, its huge flapping wings covered with turkey feathers, and built by a gentleman named Frost sometime in the 19th century. Rumours have it that Mr. Frost actually took off in this weird machine one summer's day, only to finish up first at the top of a 10 ft. high hedge and then in hospital. So far, it has been possible only to get the steam engine working again spasmodically.



The Shuttleworth Blackburn in the air after repair. It has a 50 h.p. Gnome engine. Photograph "Flight" copyright.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions which will be indicated, these should be ordered through a bookseller.

"I DROVE THE 'CHELTENHAM FLYER'"
By DRIVER J. W. STREET
(Nicholson and Watson. 8/6)

When Jim Street started as a cleaner, at the old Westbourne Park locomotive shed of the Great Western Railway in 1891, broad gauge trains were still running into Paddington. When he retired in 1936 he had been handling the most modern Swindon engines of the "Castle" and "King" classes, and had specially distinguished himself in running the "*Cheltenham Flyer*" and "*Bristolian*" expresses.

Working and operating conditions naturally had changed over the years. In later times it was no longer possible for an engineman to regard one engine as his own, but Driver Street invariably managed to get the best out of any engine that was allocated to him. At the same time he could always be relied on to keep time if this was at all possible. When and how this was so becomes abundantly clear from the account that he presents of his attitude to the day-to-day circumstances of footplate work.

Like most "Western" men, Driver Street considers the G.W.R. automatic train control installation on all main line routes to be "the best thing that was ever done for locomotive men." In addition he makes the point that with the introduction of the Churchward types of engine, which led the way in locomotive design for so long, G.W.R. drivers were given engines that were masters of their jobs instead of being just about equal to the work demanded of them.

Locomotive lovers will revel in this story of a railway career, which is plentifully illustrated and ends with logs of notable runs for which Jim Street was responsible.

"TOM BROWN'S SCHOOLDAYS"
"KING SOLOMON'S MINES"
(Ward, Lock and Co. Ltd. 8/6 each)

These two volumes do not give the actual texts of the classic stories of Thomas Hughes and Rider Haggard. They are the books of the film versions that have recently appeared, telling the stories as they are seen on the screen. All who have enjoyed the films themselves will welcome them, not only for their versions of these famous yarns, but also for the splendid illustrations. There are 80 of these in each volume, reproduced from the films to picture dramatic, humorous and interesting scenes, and many of them, including eight in colour, are of full page size.

"THE FASCINATION OF RAILWAYS"
By ROGER LLOYD
(Allen and Unwin Ltd. 12/6)

Here is a book that railway enthusiasts will read not once, but many times, for the author is one of themselves and deals in an entertaining manner with the different ways in which railways appeal to them.

Mr. Lloyd is not a specialist, although he admits to being particularly partial to steam locomotives. After delving into his earlier recollections of railways, trains and stations he passes to a series of descriptive sketches presenting different aspects of railway working and the fascination of the railway as a living organism, introducing many of the men who actually work the trains.

One chapter deals with "Station Sauntering" as practised by so many enthusiasts, and another details the journeys of trains with which the author is specially familiar. The war record of the railway service is dealt with briefly, and the book ends with a forecast of the possible railway situation in 1960.

The illustrations are numerous and well chosen.

"THE BOY'S BOOK OF SPORT"
By CARLTON WALLACE
(Ward, Lock and Co. Ltd. 12/6)

Here is a fine omnibus book covering a wide variety of games and pastimes, both indoor and outdoor. In addition to the standard school activities, its sections deal with such matters as ice skating, rifle shooting, riding, sailing, rock climbing, judo and fencing. In each case the foundations of the game or pastime concerned are simply and clearly outlined, and then come useful suggestions on correct style with 100 useful drawings to illustrate the text.

All active sports depend very largely on fitness for their practice and enjoyment and a special section therefore is devoted to the best methods of building up stamina and developing speed and skill.

In addition to the drawings the illustrations include 16 whole page plates.

"THE GIRL GUIDE OMNIBUS BOOK OF IDEAS"
By E. M. R. BURGESS
(Brown, Son and Ferguson. 5/-)

As helps to Guiders looking for games or activities of various kinds the original Books of Ideas were eagerly welcomed and proved of immense value. Now Mrs. Burgess has selected the best parts of the books and after revision has collected them in this omnibus book. The result is a useful volume with contents so varied that no Guider will be at a loss to find something that can be put to good use in her Company either directly, or with some changes to make it more suitable.

In the book there are adventures and observation games, with tests of all kinds, covering subjects ranging from seaweed and ferns to knots and the Morse Code. Competitions, display ideas and two short plays are included, and apart from the practical value of the book for Guide work it conveys an immense store of general knowledge, as full answers and solutions ar given at the end.

"BLONDEL THE MINSTREL"
By ALLEN W. SEABY (Harrap. 6/- net)

The story of the discovery by the minstrel Blonde of the prison in which his master Richard the Lionheart was kept by the Duke of Austria is one that always arouses the interest of young readers, and it is not surprising to find that Mr. Seaby has woven one of his historical stories about the incident. The romantic figure of Blondel is the principal character, and in him the author has given a fine picture of the troubadour of the Crusading era. The portrait of Richard too is excellent, and the story gives a thrilling account of the Crusade in which he took part, which was remarkable for the heroism of the Crusaders, and also for their dissensions and rivalries.

The book makes excellent reading and includes many illustrations by the author himself.

"THE HOUSE AT KILMARTIN"
By ANN RIDGE (Evans. 8/6)

The Western Highlands provide an unusual background for this long and interesting story of a family holiday. It is an outdoor book, the Gilstons enjoying sailing, fishing, deer-stalking and shooting, but they also have thrilling adventures and unearth the ruins of a long buried Chapel after prolonged and strenuous efforts. There is a mystery in the story too, which is solved when a long-forgotten letter discovered by Bob Gilston on a dusty high shelf in the village Post Office composes a great family quarrel of long standing.

The book has a frontispiece and five full page illustrations.

The Tramp and her Work

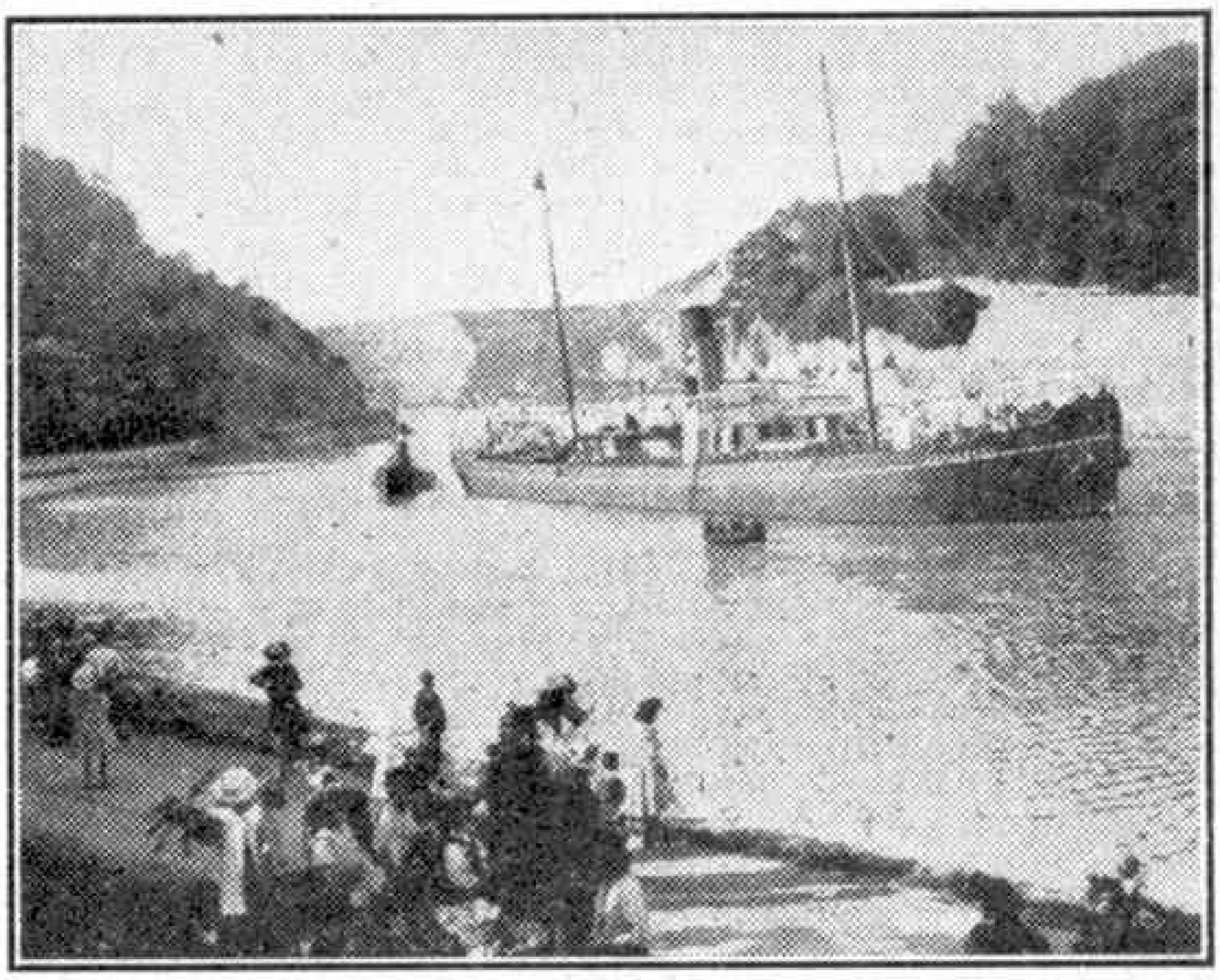
By Frank C. Bowen

THE general public is beginning to take one of its periodical bursts of interest in the tramp ship and her work, owing to the prominence which the popular Press has given to the recent rapid increase in freight rates. It is unfortunate that the picture which is generally given is quite an incorrect one, for very few landsmen have any knowledge of the modern tramp and the way her business is conducted. Even the name carries with it a derogatory suggestion which is particularly unfortunate and generally unjust. To many people any cargo ship is a tramp. Actually the name is applied only to a ship which is hired with the whole of her cargo capacity to one charterer, to be sent wherever he orders provided it is not against the conditions of the charter party. There are any number of purely cargo liners running "on berth" as common carriers to a definite timetable whether they are full or half empty.

A great difference between the liner and the tramp is that the former carries her cargo at fixed freights, which are published beforehand for the information of shippers, and that practically all the ocean routes have their conferences of shipowners who agree in the fixing and maintenance of these rates. Every now and again, of course, a line will establish an independent service and try to undercut conference rates, but these efforts seldom last for very long.

The competition between tramps, on the other hand, is free to all, not only ships flying the same flag but those of every other flag in the world. The rates change daily according to the law of supply and demand, so that it is only when there is a shortage of tonnage compared with the cargo to be carried that the rates rise as they have done recently. More often there are more ships than business offering, and the tramp owner must accept rates which only cover his running expenses and depreciation, often not even that. The running of such ships is a very complicated business and it is erroneous to think that good freights always mean big profits. It is the state of international trade which governs the profits, and often it is a very expensive business to secure a reasonable balance.

It is only the name "tramp" which is modern, dating back to mid-Victorian days. Before that her counterpart under sail was generally called a "free ship." The two forms of charter-party on which the tramp does her business, voyage charters and time charters, go back many centuries. In the voyage charters their start is too far back for any definite documentary evidence to be traced; and the charters certainly existed for trading ventures in Tudor days, probably long before that between private parties and certainly for merchant ships chartered by the Navy.

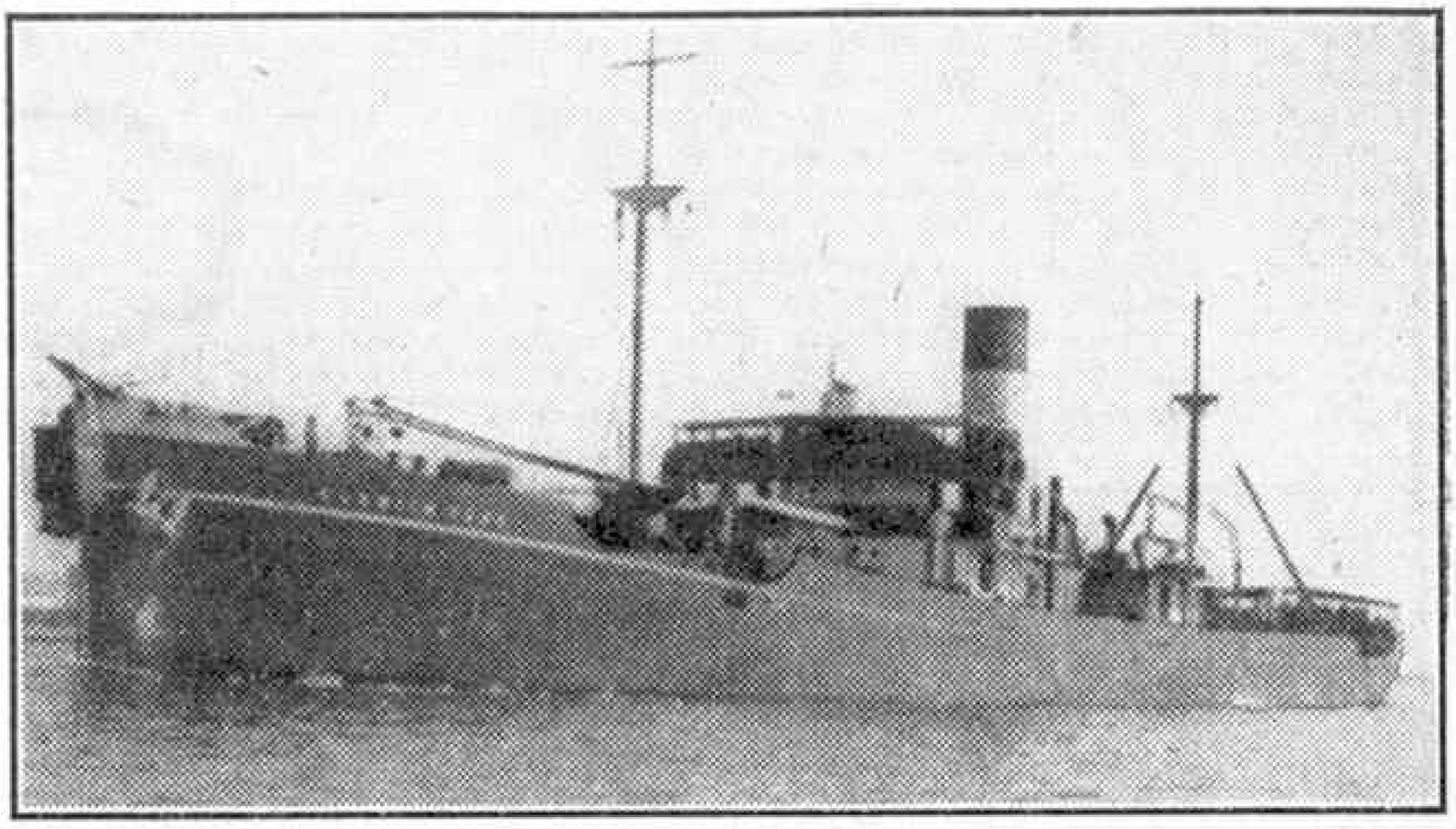


The nineteenth century tramp was generally of very modest size with a flush deck.

Most of the tramp's business is done on voyage charter. The merchant who wants to ship or import a certain quantity of any commodity which can be carried safely by tramp, which is usually a homogeneous cargo that will come to no harm either from being shot into the hold or piled up to a depth of many feet, will cause inquiries to be made for a suitable vessel to carry it direct to the port or ports of discharge without delay. He hires the whole ship, occasionally for a lump sum for the voyage but almost invariably at so much per ton of cargo

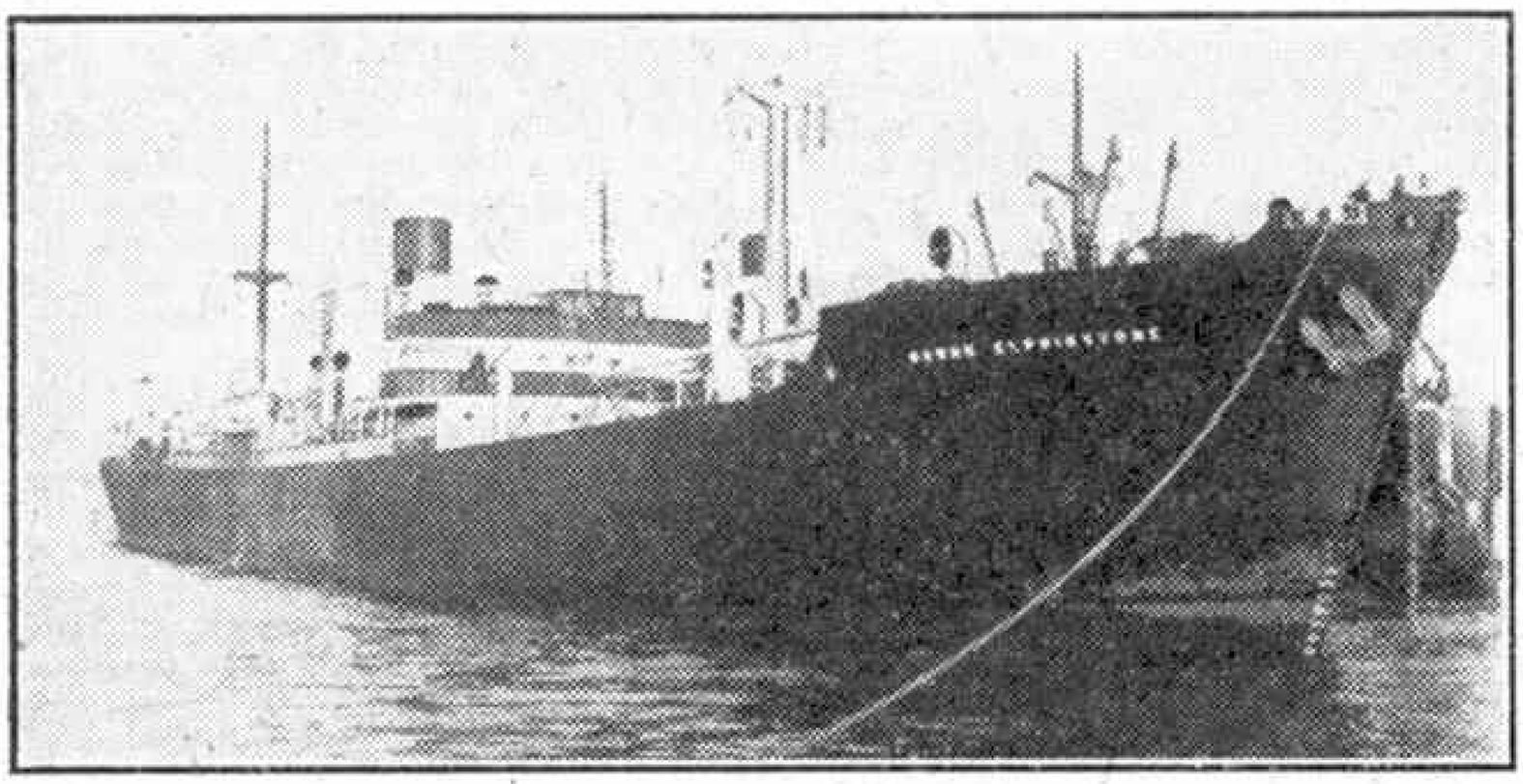
shipped, or, in the case of different kinds of timber, so much per standard or fathom.

In the charter party, as the agreement signed by the merchant and shipowner or their agents is called, there are many clauses concerning the ports or groups of ports between which the voyage is to be made; the time allowed for loading and discharging and which party is to pay the bill; the date at which the ship must be ready to load, and various details concerning the voyage. The owner protects himself against his ship being sent to a port which is dangerous for a vessel of her size or type, and the shipper is equally careful not to have the voyage unduly prolonged or the route varied without good reason. Seaworthiness, which in law covers much more than the safety of the ship, is a natural condition; a ship may be considered unseaworthy if a water-pipe leaks and damages cargo under it.



The tramp steamer "Elswick Park," of 1920, with her Suez Canal searchlight over her bow, is typical of the old full-lined three-island type.

In a time charter the details of the ship have to be guaranteed by her owners within reasonable limits, and the charterer can, within the terms of the agreement, employ her in whatever manner he thinks fit provided he returns her in the promised place at the time stipulated. She also has to be in the same condition barring ordinary wear and tear. Apart from those considerations, the charterer can use her as he thinks fit; but if he is prevented from having her services for more than 24 consecutive hours on account of her not being sufficiently stored, or breaking down in the engine room or having an accident, he has no liability until she is ready for service again. Payment is usually at so much per deadweight ton—as much as she will carry of cargo, stores, etc., to bring her down to her Plimsoll mark—per month, but some are fixed at a lump sum per month.

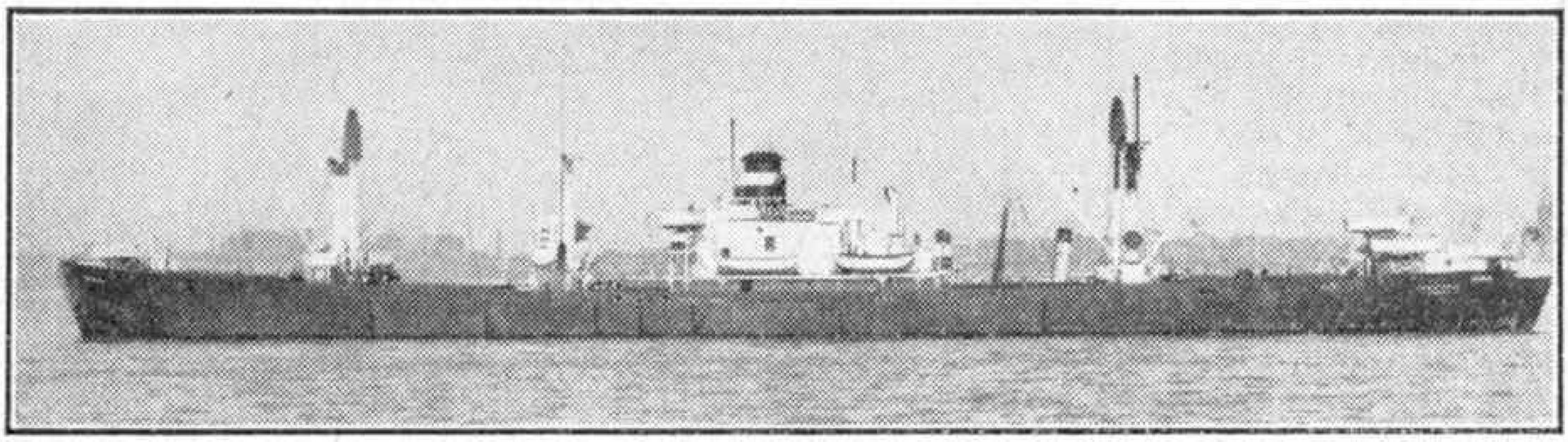


During the great slump between the two World Wars enterprising tramp owners sacrificed a little cargo capacity to obtain more speed on much less coal by improving the hull lines.

Both forms of charter have their advantages and disadvantages. Voyage charters give the tramp owner all the profit that there is in the business, but on the other hand the expenses of long delays in port, such as are troubling shipowners all over the world at the present time, fall on his shoulders; and although the charterer has to pay demurrage at so much a day if she is longer loading or discharging than the time mentioned in the charter, that seldom if ever covers his loss.

If his ship is on time charter it is generally another shipowner who hires her and he naturally wants to make his own profit. A large number of tramps are chartered by the liner companies who find themselves with more commitments than their own fleets can cover. Within the last year

or two a great many tramps have been time-chartered by the lines running to Australia in order to carry out the enormous number of motor-cars, tractors and the like which the Australians have ordered in this country. The lines have contracts with the the manufacturers to deliver them, and as their own ships have been full of general cargo large numbers of the better types of tramp have been engaged for the service. The tramp owners could not hope to get separate voyage charters from the manufacturers, and on the other hand there are very few bulk cargoes taken out to Australia; so that a time charter outward, even if it is on such reasonable terms that



The innumerable "Liberty" ships mass-produced in the U.S.A. during the Second World War are now tramping under every flag in the world.

it only just covers the cost, saves an outward ballast voyage which is a total loss to the owners if the ship has secured, or hopes to get, a voyage charter home with grain, ore, sugar, or some such bulk cargo produced in Australia and in demand in Europe.

In the old days of sailing ships on voyage charter the merchants who had a cargo to send overseas would go to one of the coffee houses where the shipowners or their representatives were to be found, and the business would be arranged over a friendly glass of wine.

Once the ship had discharged it was the captain's business to arrange her next voyage, and many of them were remarkably shrewd in picking up information concerning possible business and fixing up charters for their owners. It was worth their while, for there were many perquisites both regular and irregular. Much of the business would be on what are known as cross voyages. If a ship discharged in Australia her captain might hea. that there was a cargo of rice waiting shipment in the Dutch East Indies, and having proceeded there in ballast he would fix up a charter to India. There he might pick up a cargo of tea for the United States, and there another cargo for South America. It was by no means unusual for a voyage to last two or three years before the ship finally reached a home port, and during that time the owners might not have had more than one or two reports of her whereabouts, if that.

The freights were paid in gold, and out of that the captain paid the expenses. From time to time he might find himself in a port where his employers had an agent or correspondent, and either draw on him for necessities if he had no money in hand, or arrange for a draft to be sent home to the owners if he had a big balance. Frequently, however, particularly with a small ship which picked up cargoes in and for all sorts of small ports, the accounts were not settled until she got home, and the balance was apt to be far less than the owner anticipated. In one case that came before the courts the owner was so dissatisfied that he sued his captain; after hearing the evidence the judge told him that he appeared to have been very lucky to get his ship back.

The network of cables spreading all over the world put an end to the shipmaster doing the ship's business, and now that every ocean-going ship carries wireless he is never out of touch with his employer. All the business is done through shipbrokers, and the enterprising coffee-house keepers who laid themselves out to attract a specialised clientele have been replaced by the committee of the shipping exchanges in all the principal ports, of which by far the best known is the Baltic Exchange in London. They have an expert knowledge of the conditions in all the ports of the world, the state of the markets, the cargoes likely to be available in all countries and, perhaps most important of all, the ships either unemployed or likely to be by the time that they are needed, of the type and size required by the charterer. If he has 5,000 tons of cargo to ship, his business will not be attractive to the owner of a ship which carries 9,000; but on the other hand it is useless for the broker to consider a ship which, when she has the 5,000 tons on board, will draw two or three feet more water than there is in the port of discharge. That was a very important matter which was overlooked on many occasions by Government servants directing merchant shipping without a thorough knowledge of the business.

If the ship has to make a long voyage in ballast to reach the loading port, the owner will naturally demand a freight rate which will cover the cost; but the broker with a score of inquiries on his book may be able to arrange for the same ship to make an outward voyage to quite a different destination, and then a cross-voyage which will take her to, or within a reasonable distance of, the loading port of the homeward cargo. That is an arrangement which will satisfy everybody concerned—unless delays on the outward and cross-voyages prevent the ship reaching the loading port before the date stipulated on the charter, in which case the charterer has the right to cancel the agreement, and he will certainly do so if he has the chance of fixing another ship at a lower rate.

During the last 20 years the design of the tramp has altered greatly. Ever since the steamer began to be used for tramping purposes in the seventies of last century the great object has been to make her carry as much cargo as she possibly could, and to spend as little as possible on her machinery except for giving it rugged strength. The result was that she had very full lines and only sufficient power to give her seven or eight knots in favourable circumstances. Speed was expensive and the voyage charterers did not pay any more for it; its only value was to permit more voyages in the course of a year, which was profitable when trade was good but meant added expense if the ship had to be laid up.

During the slump between the two wars scientific naval architects persuaded the tramp owner that it was worth his while, particularly in times of depression, to pay more attention to the design of the ship. Improving the lines by tank tests would give extra speed without any extra cost in fuel, and the ability to make up time lost in bad weather would often save a charter being cancelled. The lines could make the ships more sea-kindly so that they were less liable to be damaged in heavy weather and to have their cargo spoiled. The necessity of strength and simplicity in (*Continued on page 382*)

Photography

Harvest Time

By E. E. Steele

THIS month sees the quickening activities of the farm brought to a climax, as the warm sunshine swiftly turns the pale heads of corn into a rich golden brown, and the farmer hopes for a settled spell to complete the work of the year. When he gives the word tractors quickly move in, towing the binders whose sharp knives soon reduce the serried ranks of nodding heads into neatly tied sheaves ready for the labourers to rear into the familiar stooks, so characteristic of our British farms.

We boys always enjoyed the long summer holidays on the farm with its many attractions, of rides on

Harvest landscape.

tractor and wagon, and the possibility of earning a shilling or two for pocket money, for all hands may be pressed into service to snatch the harvest while the weather holds, and the work continues until the dusk when weary limbs must have a respite.

There are endless opportunities for taking photographs in harvest-time, and many fine portrait studies may be found among the older farm labourers, whose mahogany faces pay tribute to the healthful life of the open air. Portraits may be attempted when the workers are enjoying a spell to appease their enormous appetites, often washed down with a pint of harvest "wallop," although some favour that innocuous beverage "cold tea" which appears to possess special qualities of allaying thirst.

However the typical harvest scene is one of activity, and pictures showing men at work may prove to be the most satisfying. It is better to have moving tractors and farm vehicles in a position approaching the camera instead of directly moving across the field of vision, as there is less risk of blurring. Where

The old hand. The illustrations to this article are by the author.

there is a nice sky of soft, white clouds, patterns of stooks may make a charming picture. Perhaps an evening shot will give a better result of this subject, for the stooks will cast long shadows as the sun declines, making a more artistic result than the bald record taken at mid-day, but the exposure will need to be increased by some six times, or more. If a tripod is not used fast panchromatic film will be needed to compensate for the failing light.

In making pictures of corn-stooks it is well to arrange for one stook to be in the immediate foreground to add balance and stability to the rest of the picture. By changing viewpoint it is a fairly simple matter to get the stooks into an interesting irregular pattern instead of showing straight rows, which are seldom pleasing. Attention to such small details will make all the difference between a bare record and an attractive picture.

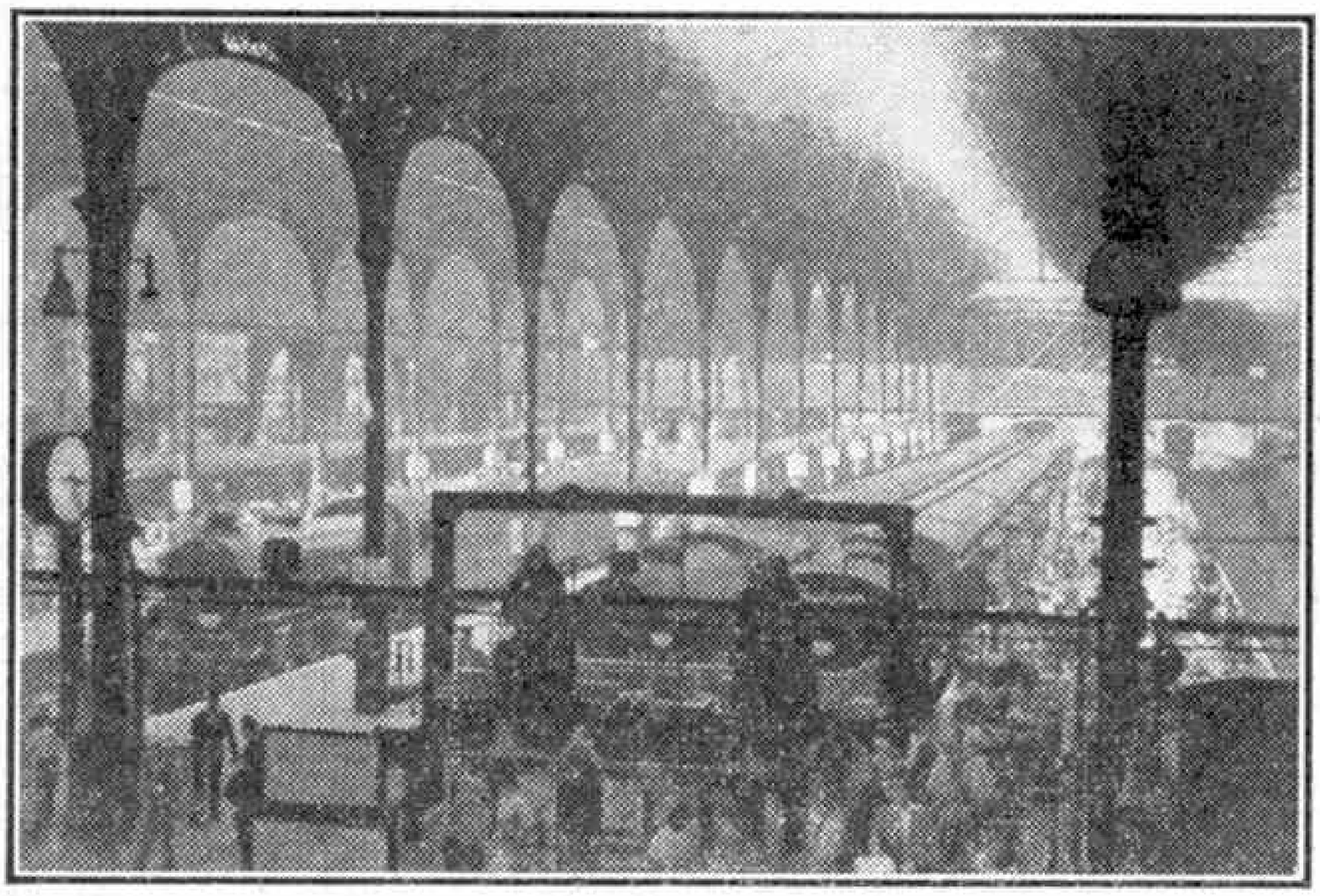
In full swing.

A Great Eastern Transformation

Liverpool Street To-day

By R. A. H. Weight

DURING the past year or so great changes, briefly referred to in "*Railway Notes*" in the March "*M.M.*," have been taking place at Liverpool Street, the extensive terminus in the City of London that until 1923 was the headquarters of the former Great Eastern Railway. This railway passed into the L.N.E.R. group in that year and is now part of the British Railways Eastern Region. Liverpool Street station has 18 platforms and deals with a huge suburban passenger traffic together with considerable main line business, as it is the principal terminal for East Anglian coastal and inland traffic.



An afternoon scene at Liverpool Street showing some of the arrival platforms. This and the lower photograph on the next page are by G. R. Mortimer, Manningtree.

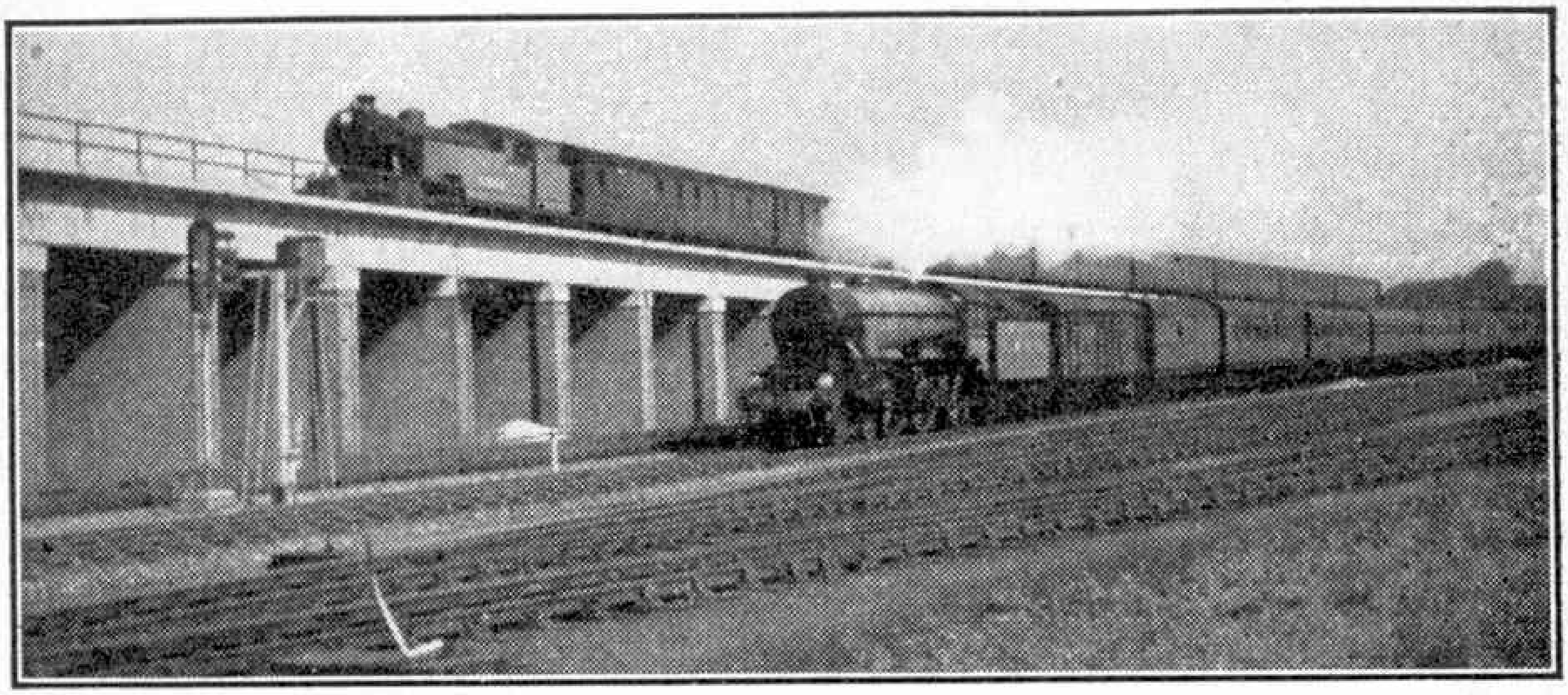
Work went on for a long while as part of a plan to improve the track layout and signalling in readiness for the 1500-volt electrification of the line as far as Shenfield, 20¼ miles out, in Essex on the Colchester route. This was officially opened in September 1949. The scheme, many times discussed over the years, was in hand before the war, but the job was suspended in 1940 and could not be resumed until 1946. Six sub-stations had to be provided and four track sectioning cabins. In addition to the sub-stations and associated work the civil engineering involved reconstruction, replacement and widening of certain bridges, much of it without interference to traffic. The overhead wire system is used so that the necessary structural work was considerable. There are two main electrical feeding points, one at Chadwell Heath and the other on the line serving Fenchurch Street.

The Liverpool Street East Side suburban platforms, those with the highest numbers, handle the electric trains, which arrive or depart at the rate of six or more an hour. These trains are formed of spacious, comfortable, green-painted rolling stock made up in sets of three vehicles each. These sets are coupled together as traffic requires to make up six-coach or even nine-coach trains which run at regular intervals and provide "all stations," part-way or semi-fast services, with additions and variations during rush hours.

Of the six tracks out of Liverpool Street as far as Bethnal Green Junction the westerly pair are not fitted for electric traction, being used by the frequent steam-worked Enfield and Chingford suburban services. Steam trains can and do run, of course, along the lines equipped with the overhead electric traction gear.

Liverpool Street station is quieter and less smoky than it was at one time, but there is still plenty of steam locomotive interest. There is excellent accommodation for passengers' refreshment and general well-being while arriving or departing. From the footbridge running across the circulating area at its inner end, also from the tearoom thereon, a fine view is obtained of platforms and trains.

Associated with the terminal developments has been the extensive



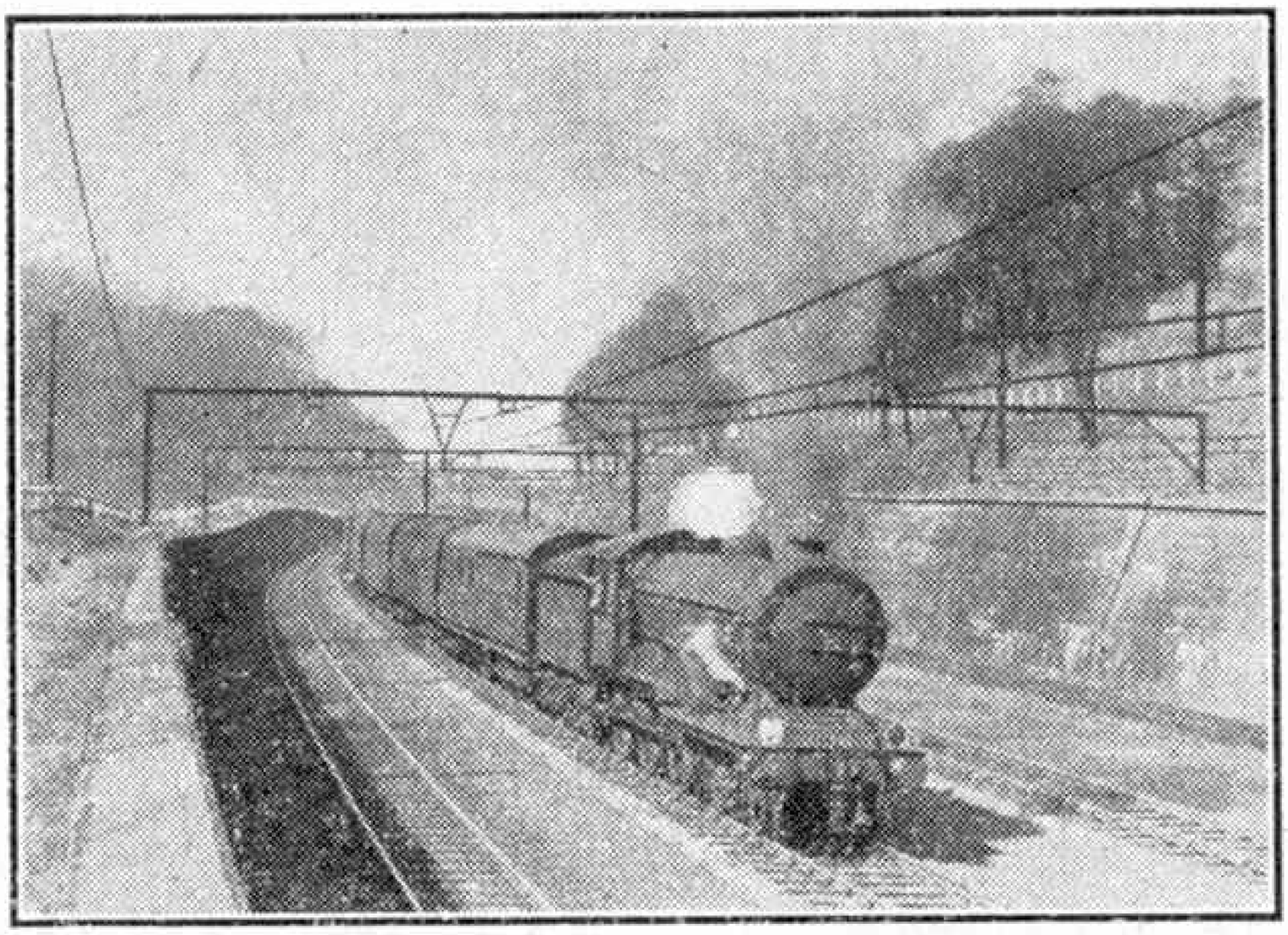
The Ilford fly-over, a notable engineering work forming an important part of the improvements made in connection with the Eastern Region electrification to Shenfield. British Railways Official Photograph.

re-arrangement and improvement of tracks and signalling down the main line to Shenfield and beyond. These include, near Ilford, a "fly-over," carrying the local lines over the main tracks to facilitate the altered workings at Stratford, Bethnal Green and Liverpool Street, and to ensure that there are far fewer conflicting movements by the many trains.

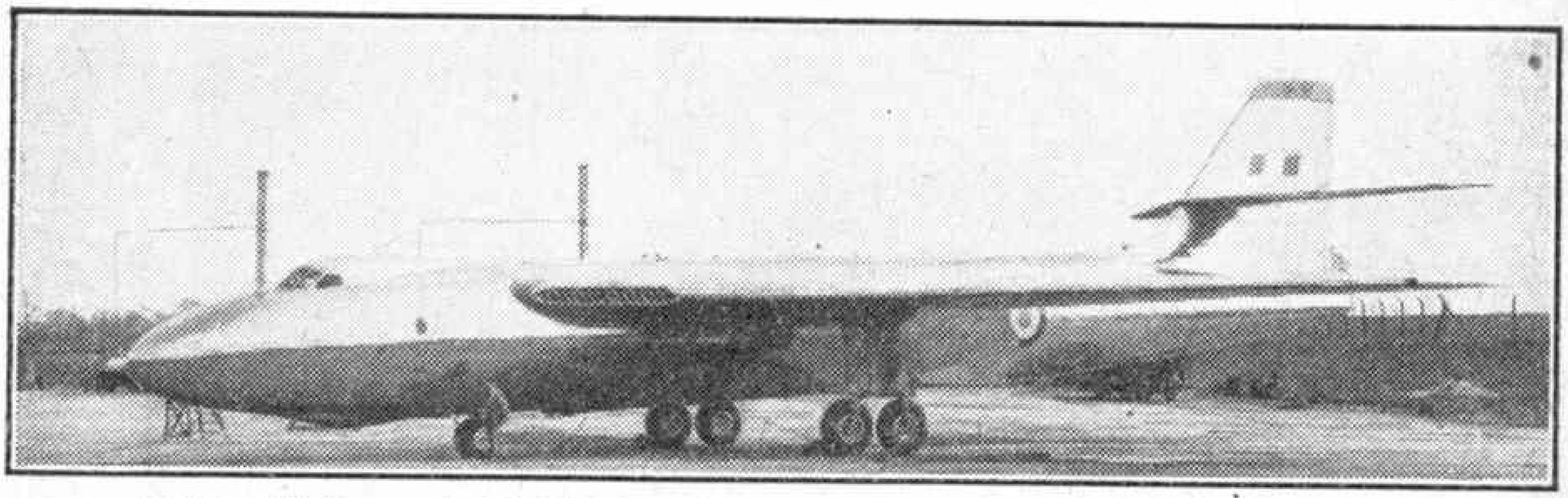
At Stratford, new suburban island platforms have been built, at the outer faces of which Eastern Region full-size electric trains call. At the opposite sides, in either direction, are seen the frequent London Transport small-scale "Tube" trains finished in red and cream. These are arranged for the conductor rail system as is customary on the lines operated by London Transport, so that two electric traction systems come alongside just there. The tube tracks descend into tunnel from these platforms in each direction; they form an extension of the London Transport Central Line through London. Part of the Central Line service into Essex runs in the open along the Loughton-Epping route of the former L.N.E.R.

Viewing, on a recent visit, the great car shed at Ilford, the new modern signal boxes and station equipment, the lineside sub-stations and other new features which have been superimposed, as it were, upon an old-established main line, one could not be otherwise than greatly impressed by the remarkable acceleration and high running speeds displayed by the electric trains. Another feature was their seemingly effortless and rapid ascent of the severe rise from Liverpool Street to Bethnal Green; and, further out, of Brentwood bank which is a severe tax on steam locomotives hauling heavy trains. Even where the gradient boards showed a rise steeper than 1 in 100 we were doing 55 m.p.h. Previously 65 had been touched along slightly

(*Continued on page 382*)



A Southend train in charge of a hard-working Great Eastern type 4–6–0 climbing Brentwood bank. Note the overhead structures and wires of the electric system.



Vickers 660 four-engined jet bomber. Photograph by courtesy of Vickers-Armstrongs Ltd.

Air News

By John W. R. Taylor

Britain's Big Bomber

The first of Britain's big multi-engined jet bombers, the Vickers 660, made its first flight on 18th May last and is now in quantity production for R.A.F. Bomber Command. It was, in fact, ordered "straight off the drawing board" long before the prototype flew.

The Vickers 660, which is illustrated above, is powered by four Rolls-Royce "Avon" turbojets, housed inside its sharply sweptback wings. Despite its huge size, it is faster than the twin-engined "Canberra" jet bomber, and has far greater bomb-load and range. When in service, it will replace the R.A.F.'s present "Lincoln" and B-29 "Washington" piston-engined bombers.

Irish Birthday

The popular Irish airline, Aer Lingus, recently celebrated their 15th birthday. They started operations in 1936 with a five-seater de Havilland "Dragon," a single route 205 miles long and a staff of twelve. Since then, the company's air network has increased one hundredfold, and they now operate a fleet of 14 "Dakotas" on 11 routes to Great Britain and the Continent.

Altogether Aer Lingus have logged 14,000,000 accident-free miles and carried 920,000 passengers, nearly a quarter of them last year. At the peak of the last summer season, 2,000 passengers a day were often carried—more than three times the total number carried in the company's first year of operation.

"York's" Big Load

Believed to be the largest and heaviest single load ever carried by B.O.A.C., a 6½-ton propeller shaft has been flown to Egypt in a "York" freighter. The shaft, which measured 19½ ft. long by 2½ ft. dia., was required for the ship "*Houston City*," stranded in Alexandria harbour.

More Flying Boats

The announcement that the U.S. Navy have placed a fourth production order for the twin-engined Martin "Marlin" anti-submarine flying boat, has been followed by news that our own Royal Air Force are considering ordering a new four-propjet flying boat for Coastal Command. It will be twice the weight of the "Sunderland" and much faster.

The war in Korea has proved the value of flying boats for anti-submarine and anti-shipping patrol, especially in regions where there are few airfields, and an aircraft like the "Marlin" is roomy enough to accommodate a very wide selection of radar search equipment and offensive weapons.

Westland's New Helicopter

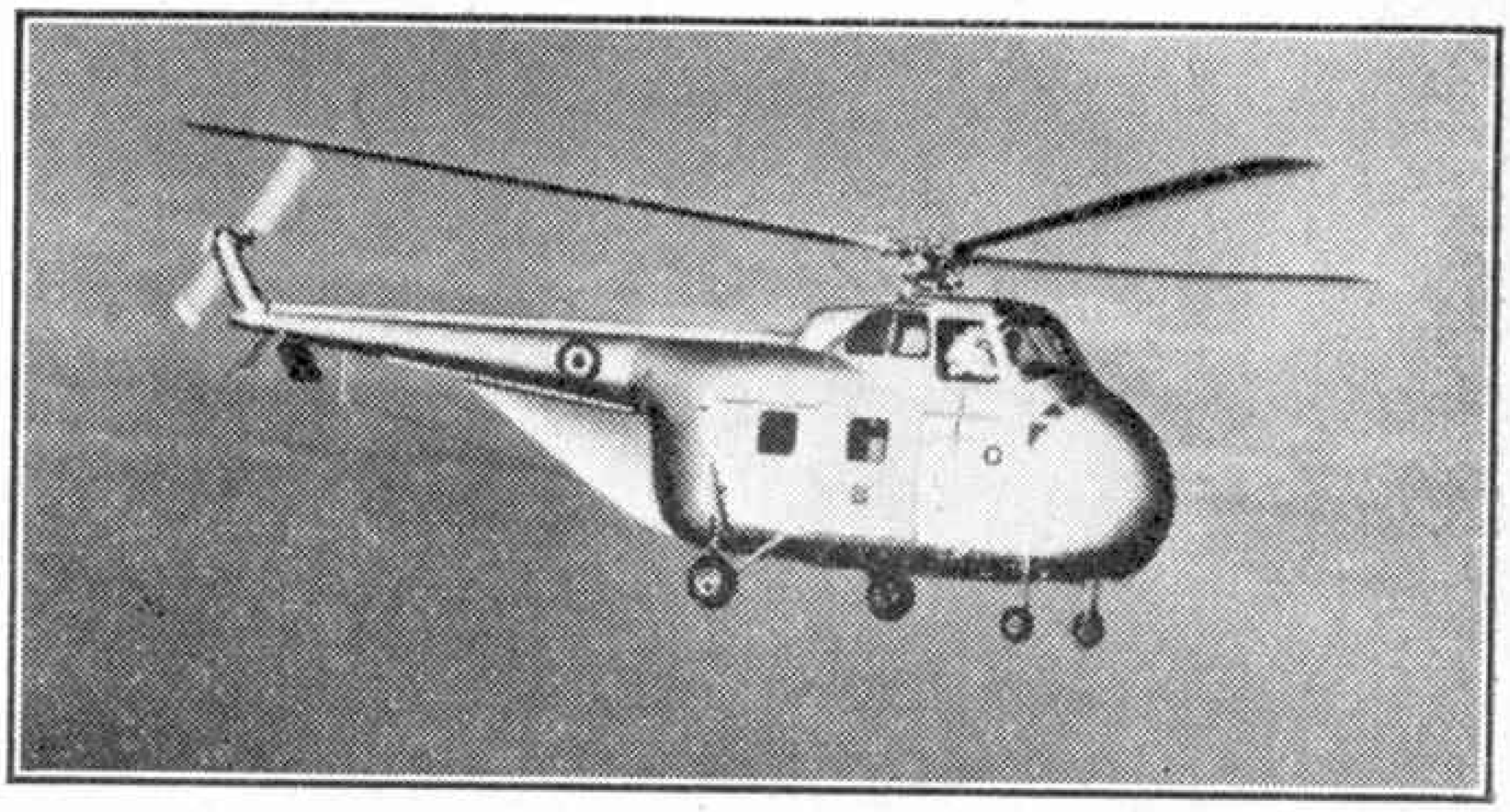
As a result of their highly successful production of the S-51 "Dragonfly," Westland Aircraft Ltd., of Yeovil, have obtained the licence to build in this country a newer and larger Sikorsky helicopter, the S.55. Intended for a wide variety of civil or military duties, the S.55 can carry up to 10 passengers, six stretchers or a heavy load of freight.

It is not unlike the S-51 in appearance, but introduces several novel design features. For example, the 600 h.p. Pratt and Whitney engine is mounted inside large "clam-shell" doors at the nose, to facilitate servicing, and drives the three-bladed main rotor and two-bladed tail rotor through a system of extension shafts. The crew of two sit above the engine and the cabin, which has a big sliding door for easy loading.

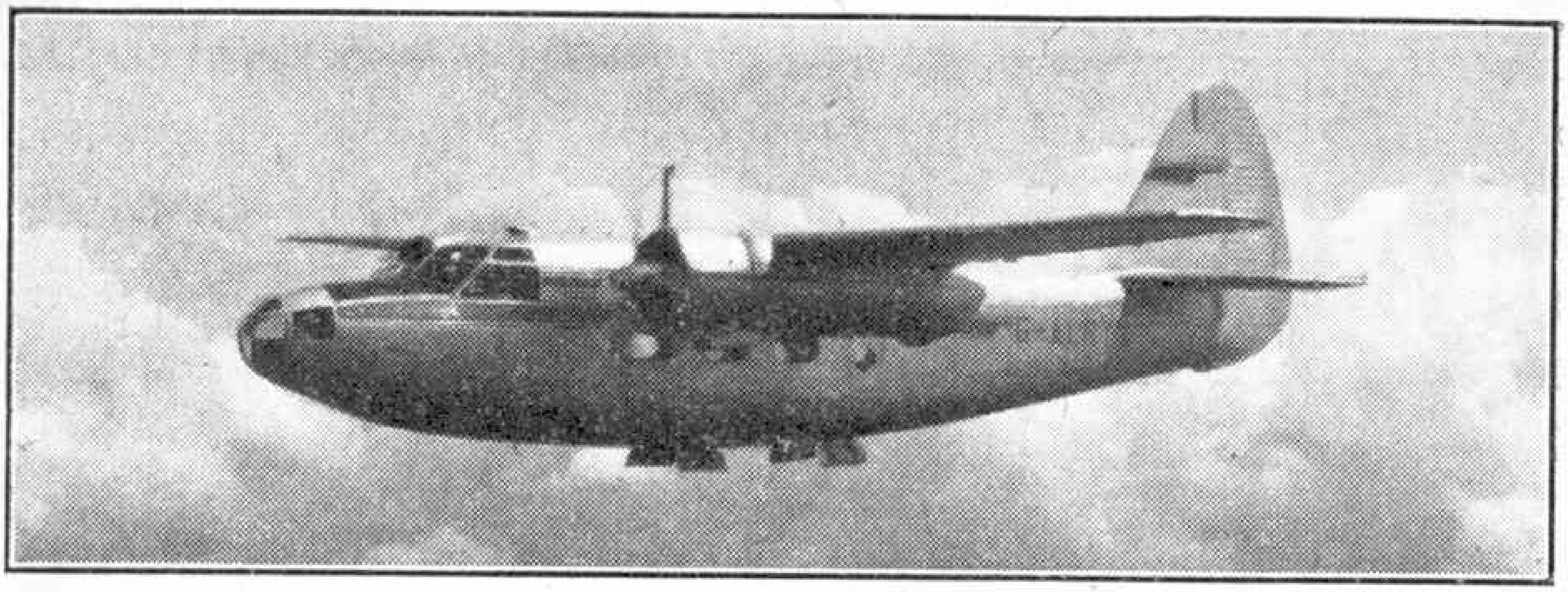
The S.55 weighs 6,800 lb., has a range of over 400 miles and top speed of 110 m.p.h.

British Glider Record

Fl. Lt. A. W. Bedford of the Royal Aeronautical Establishment, Farnborough, has set up a new British distance record for gliders by flying 253 miles from Farnborough to Usworth Airfield, near Newcastle-on-Tyne, in an "Olympia" glider built by Elliots of Newbury.



The Sikorsky S.55 helicopter described on this page.



P.54 aerial survey version of the twin-engined Percival "Prince," showing the camera aperture doors open. Photograph by courtesy of Percival Aircraft Ltd.

"Prince" Production

Percival Aircraft Ltd. of Luton, Beds., have announced further substantial orders for their "Prince" twin-engined light air liner, which is already in service with the Royal Navy for communications and training duties.

The Ministry of Supply have ordered "Princes" for carrying passengers and freight to and from the Long-Range Rocket testing ground at Woomera in Australia. Others have been ordered by the Ministry of Civil Aviation for service with the M.C.A. Telecommunications Branch, which is responsible for the testing and co-ordination of all air traffic control systems throughout the British Isles, and for the correct functioning of radar, radio and navigation aids at airports.

Shell Petroleum have ordered a further batch of 8–10 seat "Princes," to supplement those operated by the company for over a year in Venezuela and Borneo; and the Governments of Thailand, Tanganyika and Switzerland have chosen the "Survey Prince" for important air survey and photography work.

The "Storpedoette"

Further expansion of the famous Australian Flying Doctor Service is likely to follow development of a new type of container in which fragile surgical instruments and medical supplies can be dropped from aircraft near isolated farms, independently of airstrips. Developed from the wartime "storpedo," the new "storpedoette" is made of cardboard and measures about 24 in. by 8 in. In addition to a built-in parachute, it has an inflated nose to cushion the fall when the container hits the ground.

Woman's Jet Record

Mme. Paul Auriol, daughter-in-law of the French President, has set up a new woman's international speed record by covering a 100 km. circuit at an average of 508 m.p.h. in a "Vampire" jet fighter. The record was held previously by Miss Jacqueline Cochran, of America, at a speed of 470 m.p.h.

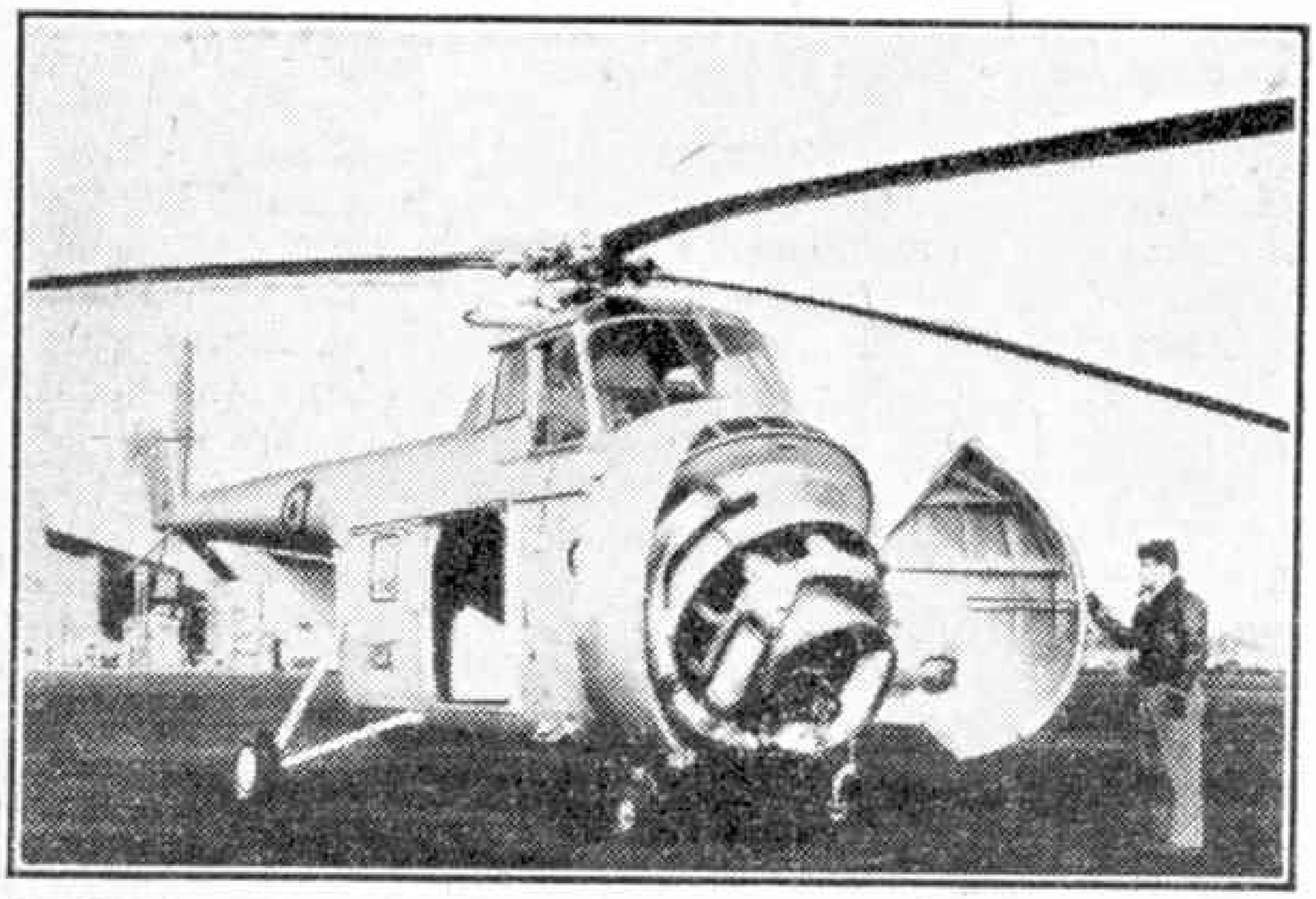
The "Vampire" used by Mme. Auriol was built in France by S.N.C.A. du Sud-Est and was powered by a Rolls-Royce "Nene" engine.

New "Neptunes"

Two new versions of the Lockheed "Neptune" have been announced. One version, the P2V-5, is a formidable anti-submarine patrol bomber, powered by two 3,250 h.p. Wright "compounded" engines and carrying more radar equipment and heavier armament than previous models. Its nose has been modified to accommodate a cannon-armed turret.

The other new "Neptune" is an air-sea rescue version, equipped to carry an airborne lifeboat under its fuselage. It can also be used to drop rescue equipment varying from complete survival kits containing emergency housing, medicine, radio and food, to light subsistence kits for a single meal.

Present holder of the World's Long-distance Record, the "Neptune" is ideal for any duties involving long, arduous patrol over land or sea in any climate, and it is welcome news that some squadrons of R.A.F. Coastal Command are soon to be re-equipped with "Neptunes."



In this view of the Sikorsky S.55 the big "clam-shell" doors at the nose are open, revealing the 600 h.p. Pratt and Whitney engine.

Persian Pest Control

Several "Halifax" freighters were chartered recently to fly 7-ton consignments of a new insecticide named Aldrin to Abadan, to combat one of the worst locust plagues experienced in Persia for 70 years. The insects were reported to be three feet deep in places.

The Aldrin, which was paid for by the American State Department, was so toxic that it had to be carried to Persia in specially-built containers. It was sprayed on the locusts by light aircraft, flown from the United States in "Skymaster" transports.

HOW THINGS ARE MADE:

Pottery

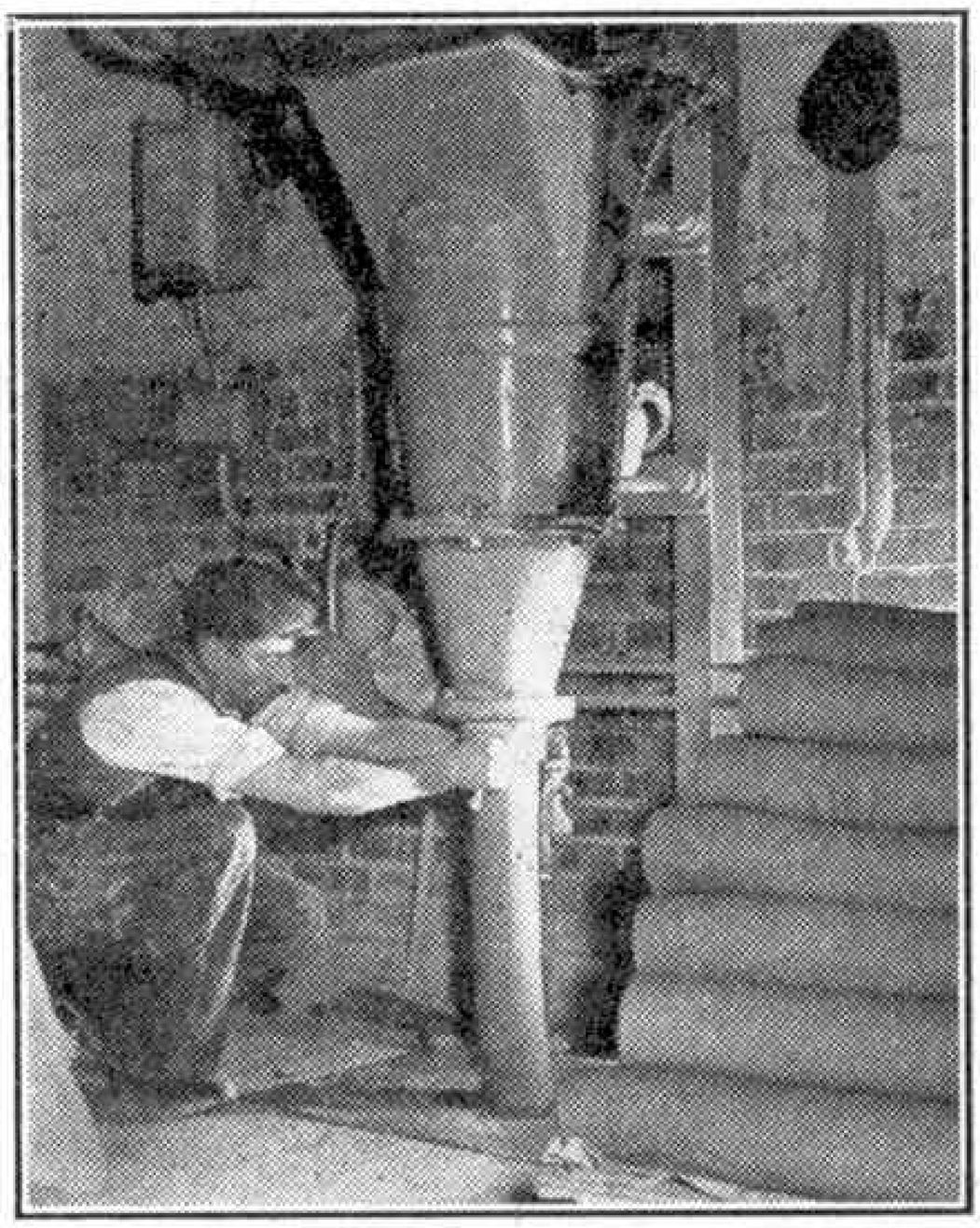
By W. H. Owens

ALTHOUGH pottery manufacture is one of the oldest and most primitive crafts of mankind, it has a very important place in our civilisation to-day. Table crockery forms the bulk of all the ware produced, but the term "pottery" covers a wide range of merchandise made out of baked clay. In the utilitarian line there are sanitary ware and piping, glazed tiles, statuary for gardens, electrical porcelain and specially prepared laboratory china. Ornamental pottery, which is a fine art, includes beautiful printed or hand-painted ware in a host of wonderful designs and forms.

England has a long-established pottery industry, which has given its name to that part of Staffordshire where Josiah Wedgwood began his world-famous concern 200 years ago. The Potteries actually consist of half a dozen towns centred about Stoke-on-Trent. Together they form a continuous, built-up and densely populated area of a quarter of a million people, with the tall smoking chimneys of hundreds of bottle kilns dominating the landscape.

In the Potteries to-day, modern electrically-equipped factories rub shoulders with old-fashioned workshops that contain little beyond the traditional throwing wheel and baking furnace. The bottle kiln, which burns coal, is the old method of firing. The modern way is by means of gas or electric ovens, known as tunnel kilns, through which batches of ware, stacked on heat-resisting trucks, pass in continuous procession. In years to come the tunnel kilns will entirely replace coal-burning ones, and the Potteries will be freed of their eternal smoke pall.

A fine example of the modern industry is the Barlaston Works at Stoke-on-Trent, where Wedgwoods carry on their 200-year old tradition under ideal conditions. This is the first all-electric pottery in Great Britain and was built just before the last war. All the main processes of manufacture are carried out on one floor in unbroken sequence, from the clay-mixing department, which adjoins a railway siding where raw materials arrive, to the packing house at the far end of the factory.



Preparing clay in the pug mill for use by the potters.

The clays that are the potter's raw materials are obtained chiefly from the south-west of England. They include Cornish china clay, china stone, and ball clay, one of the chief ingredients of earthenware. To these are added calcined flints, which are first ground to a fine powder in a mill.

Each ingredient is separately mixed with water in a machine fitted with rotating blades, which churn the liquid to the required consistency. These liquids are pumped in turn, and in the correct proportions, to the large measuring tank for blending. A gauge on the outside of this tank shows the exact volume and scales show the weight. Thus the total dry weight of materials to be used in each mixing can be calculated. The blended liquid clay is termed slip.

To ensure purity, the slip is passed through very fine-mesh sieves and over an electro-magnet which removes any iron particles. Then it is pumped under pressure into a filter press. This is a machine consisting of iron compartments lined with fine-mesh filter cloths. Pressure forces the water through the cloths, leaving behind square slabs of plastic

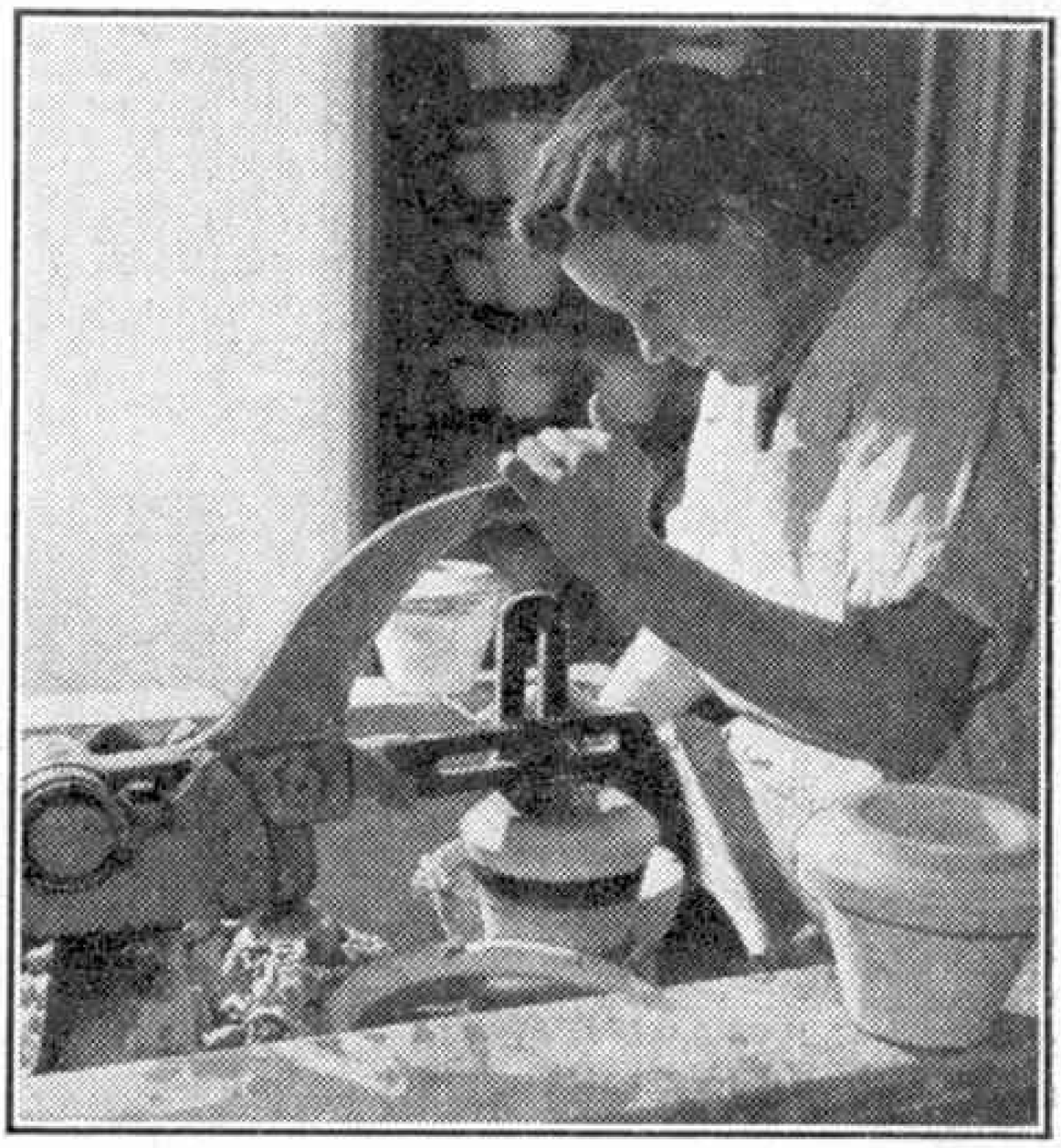
clay weighing about a hundredweight each.

But the clay is not yet in perfect condition for working. To make it so, the material is thoroughly mixed again and kneaded in a giant mincing machine called the pug mill. From this mill it is extruded in an endless roll and convenient lengths are cut off for the potters.

Even in the most modern factory, the age-old potter's wheel still has its place, because certain shapes of high-class decorative ware have to be "thrown" in the traditional way. It is fascinating to watch the skilled hands of the thrower transform a shapeless lump of clay into a vase, a jug or some similar article. He controls the speed of the wheel by means of a foot pedal, so that both hands are free to form the shape of the pot. With deft and lightning movements of fingers and thumbs he manipulates and gradually brings life and meaning to the clay as the wheel spins round.

Most ware produced to-day is shaped more quickly and economically in moulds, however. The mould-making process itself demands considerable skill, for accuracy is highly necessary. Whenever a new shape is designed, the piece must first be modelled in clay, but of a larger size than the finished article to allow for shrinkage of the mould reproductions during firing. It is from this model that a series of plaster of Paris moulds are produced.

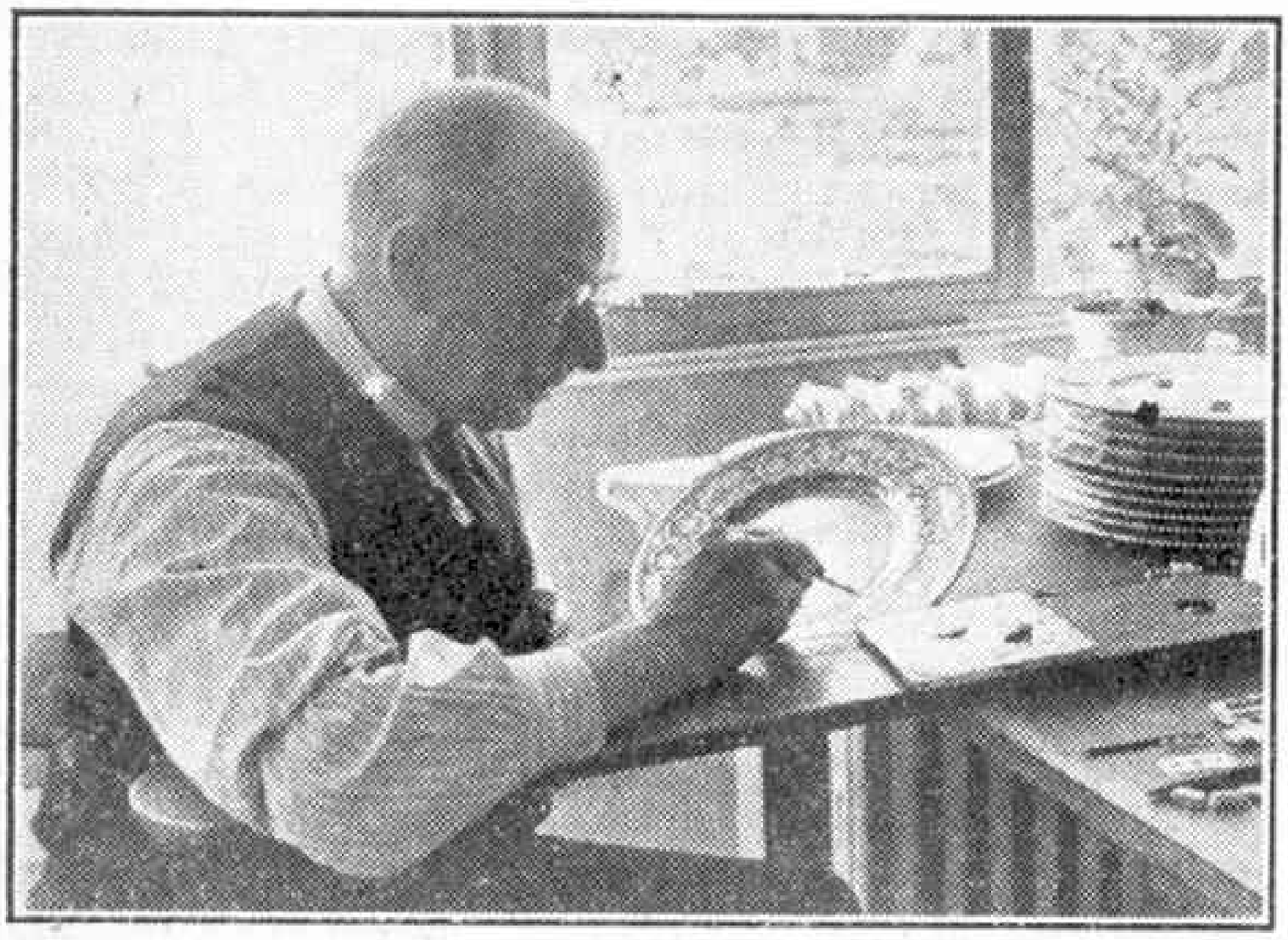
Since a mould has only a limited life, the block mould made from the original clay model is not used for reproduction purposes. Instead what is called a case mould is made from the block, and from the case come the potters' working moulds, which can be reproduced from the case as required. Moulds for such articles as plates and cups are specially made to fit on to the head of the machines used for ware of this kind.



A jolleyer lowers a profile into a cup to shape the inside. The outside has already been formed by skilful use of the fingers in drawing the clay up in the mould. British Official Photograph.

Plates are made on a machine called a jigger. First, a ball of clay is flattened on a revolving wheel by the lowering of an automatic spreader. This flattened clay is next thrown on to a plaster mould fitted to another wheel that shapes the front, or upper surface, of the plate. As this wheel is rotated at high speed, the platemaker lowers a metal profile, which shapes the back of the plate. He controls the profile with his left hand, while his right is free to work and lubricate the clay with a damp sponge. Saucers are made in just the same way as plates.

The cup-making machine is called a jolley. This works on the same principle as the plate jigger, but the chief difference is that the rotating mould forms the outside of the cup while the profile shapes the inside. The mould is placed



A crest painter, an artist in gold raised paste, at work on a plate.

on the rotating head of the jolley, and the cup-maker skilfully draws up the clay inside the mould with her right hand. She then releases the lever to which the profile is attached, and this profile fits inside the mould at a distance equal to the thickness of the cup. As with plates, this thickness is regulated as required.

Many pottery articles can only be made by the casting method, either for technical reasons or because of their shape. The potter pours liquid slip into the working moulds, which are allowed to stand for a short time while the plaster absorbs the water, leaving behind a solid deposit of clay. While it is drying, the clay piece contracts slightly and can thus be removed easily when the mould is opened. The mould may be in two or more parts according to the shape of the article it represents.

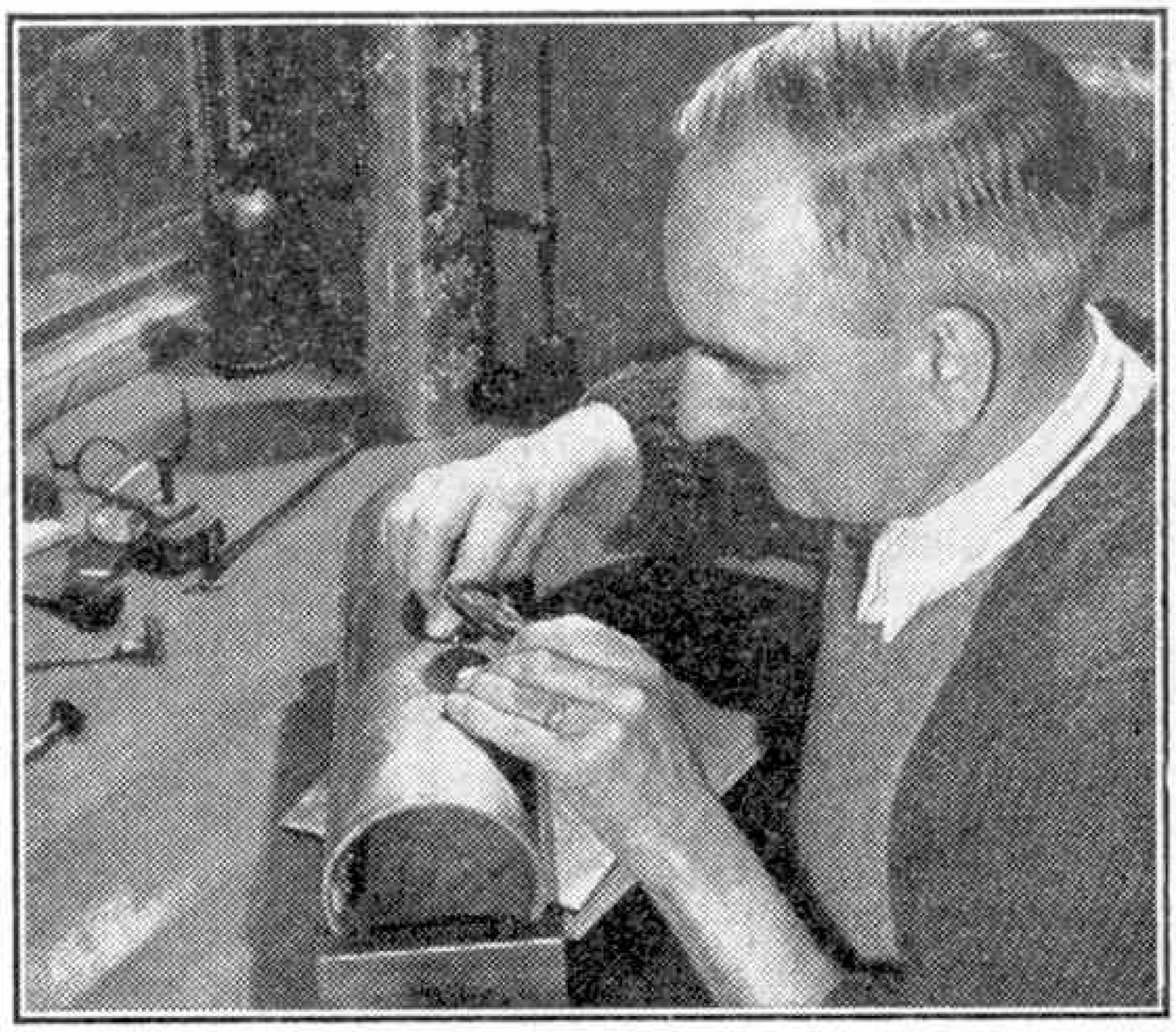
Cup handles are made either by casting in a mould, or by cutting and shaping by hand from long strips of clay squeezed to the right thickness in a special machine. When dry the ends of a handle are damped with liquid clay and can be firmly fixed in position on the cup or jug by applying the correct pressure. To secure a really strong joint the handles must be of exactly the same clay consistency as the articles to which they are to be attached.

Every piece of ware undergoes two firings. First comes the "biscuit" firing, which prepares the pottery for glazing and decorating. Before firing, the clay must dry off to white hardness, with the maximum amount of water evaporated. Then the pieces are skilfully placed on the refractory fireclay bats, which are built on tiers on the trucks that carry them through the tunnel ovens. Flat pieces such as plates are bedded in sand layers, one above the other, so that they may contract evenly.

The second firing is called the "glost" firing. The process is similar to the first, except that no two pieces of glazed ware must be allowed to touch, otherwise the glazes on them would fuse together in the oven. So all the various articles on the trucks are kept apart by specially designed fireclay supports.

The electrically-heated oven at Barleston works is the most modern of its kind in this country. It is a double-tunnel oven, and fires biscuit and glost simultaneously through two adjoining tunnels. Trains of 50 trucks are propelled slowly through each tunnel for a distance of 273 ft. The maximum temperature in the biscuit tunnel is 1,200 deg. C. and in the glost 1,160 deg. C.

Between the two firings come the glazing and decorating processes. Ware from the biscuit oven is dipped in liquid glaze of cream-like consistency. The glaze is composed of "frit," a glass-like substance ground and mixed with water, clay and flint. Glazed ware is dried in a heated chamber before it goes for the glost firing or for decoration.



The chief engraver in the Wedgwood pottery works engaged in some intricate work.

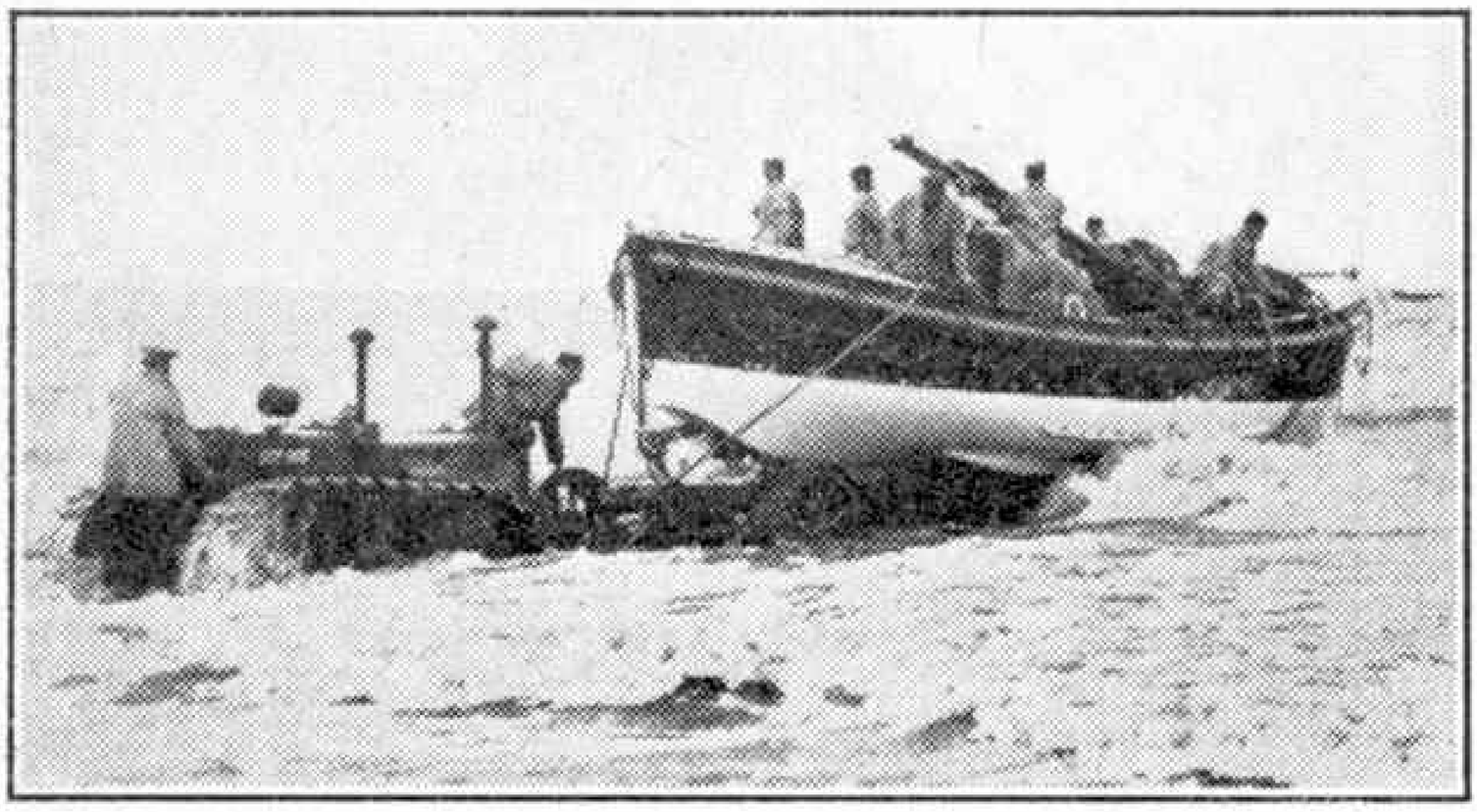
The decoration departments are among the most fascinating in the factory and include a variety of processes. Patterns for reproduction on chinaware are first engraved on flat copper plates or copper cylinders. Engraving is done with a sharp-pointed tool called a graver. Prints are taken from the engraved copper, and these are the transfers with which coloured patterns are reproduced on the ware.

Printed patterns can be enriched by the addition of ceramic colours painted on by a process known as enamelling. Underglaze colours last for ever, but their range is limited by the high temperature in the glost oven. There is an unlimited range of onglaze colours, however, and these are made permanent by an extra firing in the enamel kiln. The finest and most expensive china is still hand-painted.

The Story of the Life-boat

FOR centuries a wrecked ship was looked upon by those living on the coasts as a gift to them from the sea, and they hurried down at once to gather in a harvest. It is recorded that in the Scilly Isles there was even a prayer, not that wrecks should happen, but that if they did they should be guided into the Scilly Isles for the benefit of the poor inhabitants!

All that is a thing of the past thanks to the men who founded our life-boat service and those who fostered it until it grew into the magnificent organisation of to-day, familiar to all of us as The Royal National Life-Boat Institution. A concise but absorbingly interesting account of this body, and of the wonderful work of its life-boatmen, is given in "*The Story of the Life-Boat, 1824-1951.*"*



A launch by tractor at Skegness. Photograph by courtesy of "The Skegness News."

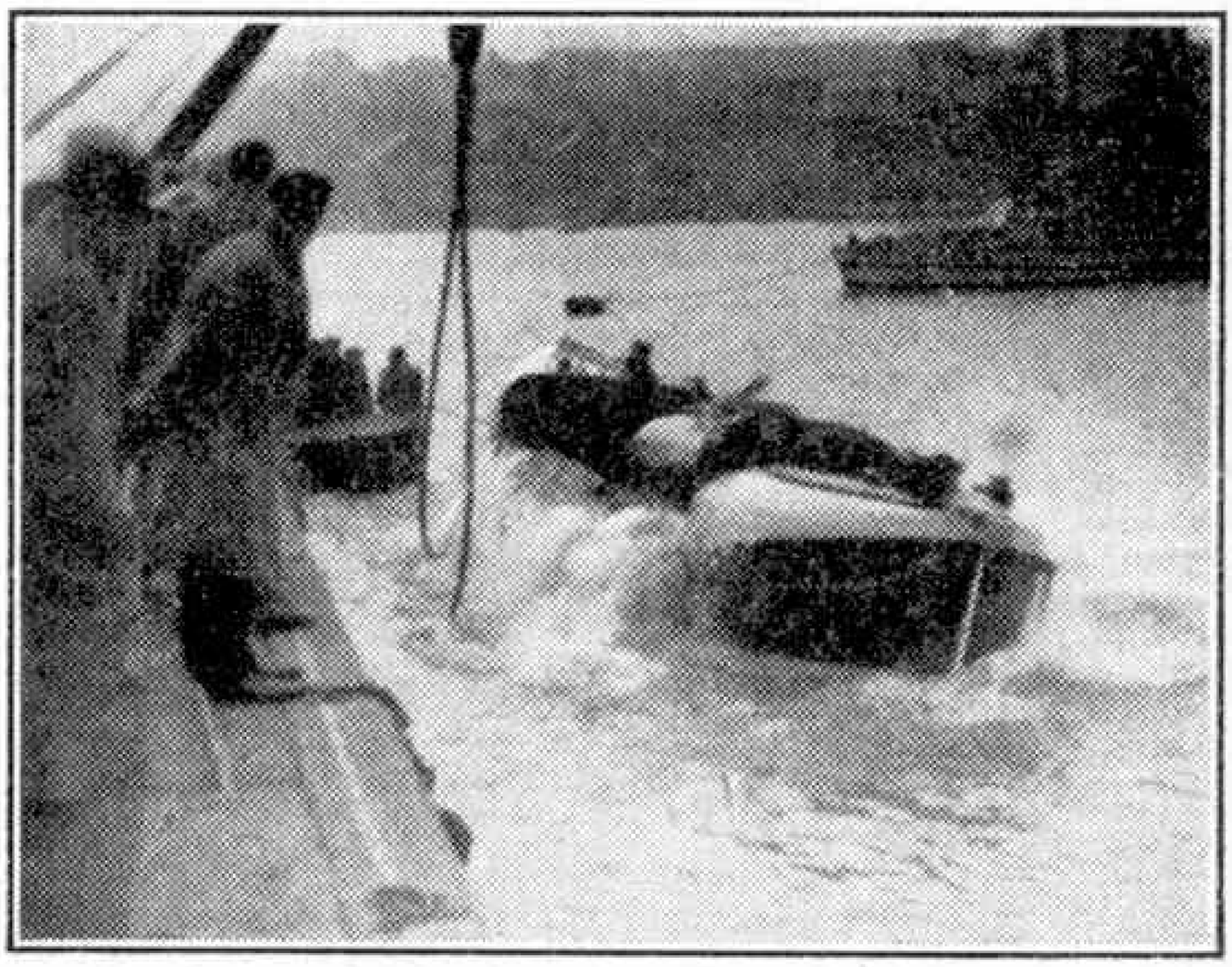
The first life-boat, constructed by a London coachbuilder for Archdeacon Sharp, a clergyman in Northumberland, was stationed at Bamburgh in 1786. This was followed a few years later by the "*Original*," built from designs submitted by various inventors, including William Wouldhave, a house painter and teacher of music, who was given half of a prize offered for a successful design.

From these modest beginnings to the splendid vessels of to-day, unsinkable and well equipped, with powerful engines, is a long and interesting story. The Institution itself was founded in 1824 by Sir William Hilary, who was neither a shipowner nor a sailor, but a retired soldier. He himself took part until he was 63 years of age in rescue work in Douglas Bay, in the Isle of Man, where he helped to save more than 300 lives. Everything connected with the Institution is voluntary. The funds required, which have now reached the enormous figure of £750,000 a year, are raised from subscriptions and collections; and the crews of the life-boats, who hazard their lives freely and willingly, are all volunteers.

To-day there are 153 motor life-boats stationed around our shores, the last of the sailing vessels having been replaced nearly three years ago. Full details of the construction and equipment of these splendid vessels are given, and interesting comparisons with the life-boats of earlier days show how much more capable the life-boatmen now are of bringing aid in stormy and raging seas to the shipwrecked. There has been a remarkable increase in the work of the Service during the last 30 years. From 1921 to 1925 the yearly average of launches was 239; in the six years since the war the average has been 595, and in that time nearly 3,000 lives have been saved.

A striking example of the devotion of life-boat men was the rescue, nearly two years ago, of the crew of a yacht that had been carried deep among the rocks near the Island of Jersey. The life-boat at St. Helier had been out for nine hours searching for an aeroplane and the crew were returning home, weary and battered, when they were informed by radio that a light had been seen among the rocks. They turned immediately, found the light and without hesitation drove their life-boat among the rocks in the stormy darkness until they were able to throw a line on board the yacht and tow it out of danger. For every second of the 15 minutes that the actual rescue took the boat was on the edge of disaster, and if she had grounded on a rock she would have been battered to pieces and her crew destroyed.

Next day the life-boat inspector went out in the life-boat to the scene of the rescue. The sea was calm and he asked the coxswain to take him closer, so that he could see where the yacht had been plucked from destruction. The coxswain's reply was "Oh, no, sir, I wouldn't like to go in there now. We might hit something." In the darkness, with the lives of others at stake, there had been no hesitation on the part of the coxswain and his crew, all of whom acted with the courage and devotion that is characteristic of the life-boat service.



Testing a self-righter; up she comes!

* "*The Story of the Life-boat 1824-1951.*" *Royal National Life-boat Institution, Life-boat House, 42, Grosvenor Gardens London S.W.1. Price 1/- post free.*

New Meccano Model

Electrically Driven Military Light Tank

THIS month's new model represents a light tank and it is a most interesting one to construct and operate. It is driven by an E20R Electric Motor which moves the tracks through a neat and compact differential. This mechanism permits either or both tracks to be driven at will, the selection being effected by a control lever.

The chassis of the model is made from two 9½" Angle Girders each extended downward by a 9½" Flat Girder, and connected by a 3½" Angle Girder 1 and by two 3½" × ½" Double Angle Strips 2. An E20R Electric Motor is bolted by its flanges to the Double Angle Strips 2 as shown in Fig. 2. The Motor side-plates are extended by 3" × 1½" Flat Plates, in which are mounted the shafts bearing the reduction gears.

A ½" Pinion on the Motor shaft meshes with a 57-tooth Gear on a Rod that carries also a ½" Pinion 3. Pinion 3 meshes with a 57-tooth Gear on a Rod fitted with a ½" Pinion 4, which engages a further 57-tooth Gear 5 fixed on a Rod 6 (Fig. 2). A ¾" Sprocket also fixed on Rod 6 is connected by Chain to a 1½" Sprocket forming the driving gear of the differential.

The bearings for the rear axle are provided by the chassis Girders, and by a 7½" Angle Girder 7 on each side, each of which is attached to the chassis by two 2" Angle Girders. The differential cage is built up by bolting two 1½" × ½" Double Angle Strips between a 1½" Sprocket and a Wheel Disc. Two ¾" Pinions 8 are mounted on a 1½" Rod passed through the centre holes of the Double Angle Strips, and a Coupling 9 is fixed on the Rod between the Pinions. One Pinion is free on the Rod and the other is fixed, and both are spaced from the Coupling by two Washers.

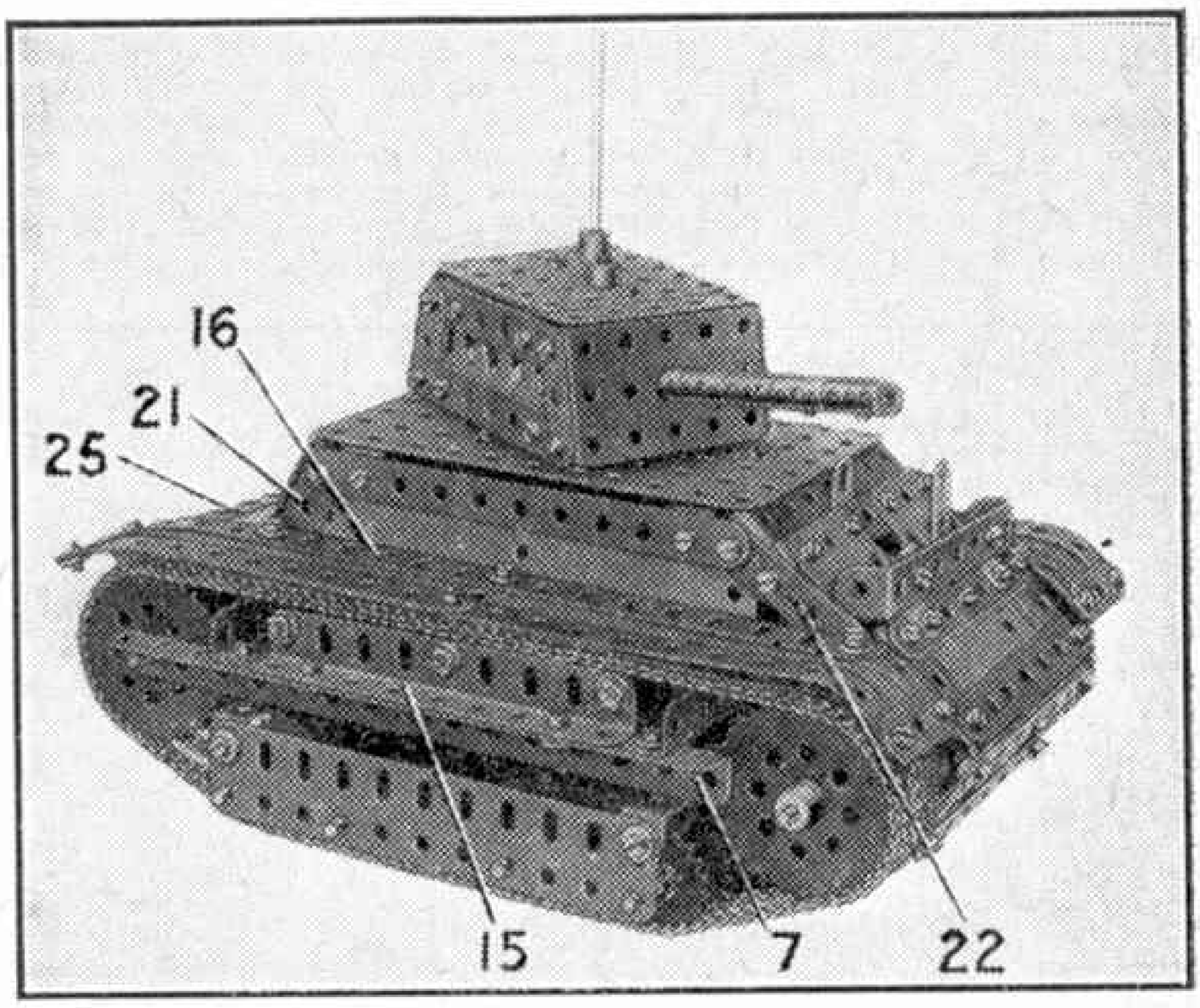


Fig. 1. A light tank steerable by its tracks. The model incorporates a differential transmission to the tracks and is driven by an E20R Electric Motor.

The driving axles are passed through Girders 7 and the chassis Girders and into the longitudinal bore of the Coupling 9. A ¾" Contrate fixed on each axle meshes with the Pinions 8, and four 2" Sprockets are carried on the axles as shown in Fig. 2.

The leading axle is a 6½" Rod mounted in the chassis, and it is fitted with two 2" Sprockets on each side. These Sprockets are free to turn and are held in place by Collars, and two ¾" Bolts are screwed into the boss of each of the inner Sprockets. The Bolts are fixed in position by nuts.

The steering lever is a 2½" Strip lock-nutted to a 1½" Strip bolted to a Trunnion 10. The Trunnion is fixed to a 2½" Flat Girder bolted to the Girder 1, and the bolts serve also to hold a 2½" × ½" Double Angle Strip 11. A 3½" Rod is freely mounted in the Double Angle Strip, and is fitted with two Spring Clips and two Collars 12. A Bolt held by two nuts at the lower end of the steering lever engages between the Collars 12, so that by moving the lever the 3½" Rod can slide in its bearings to engage either of the ¾" Bolts fixed in the Sprockets. This arrangement prevents one track from operating, while the other is still driven

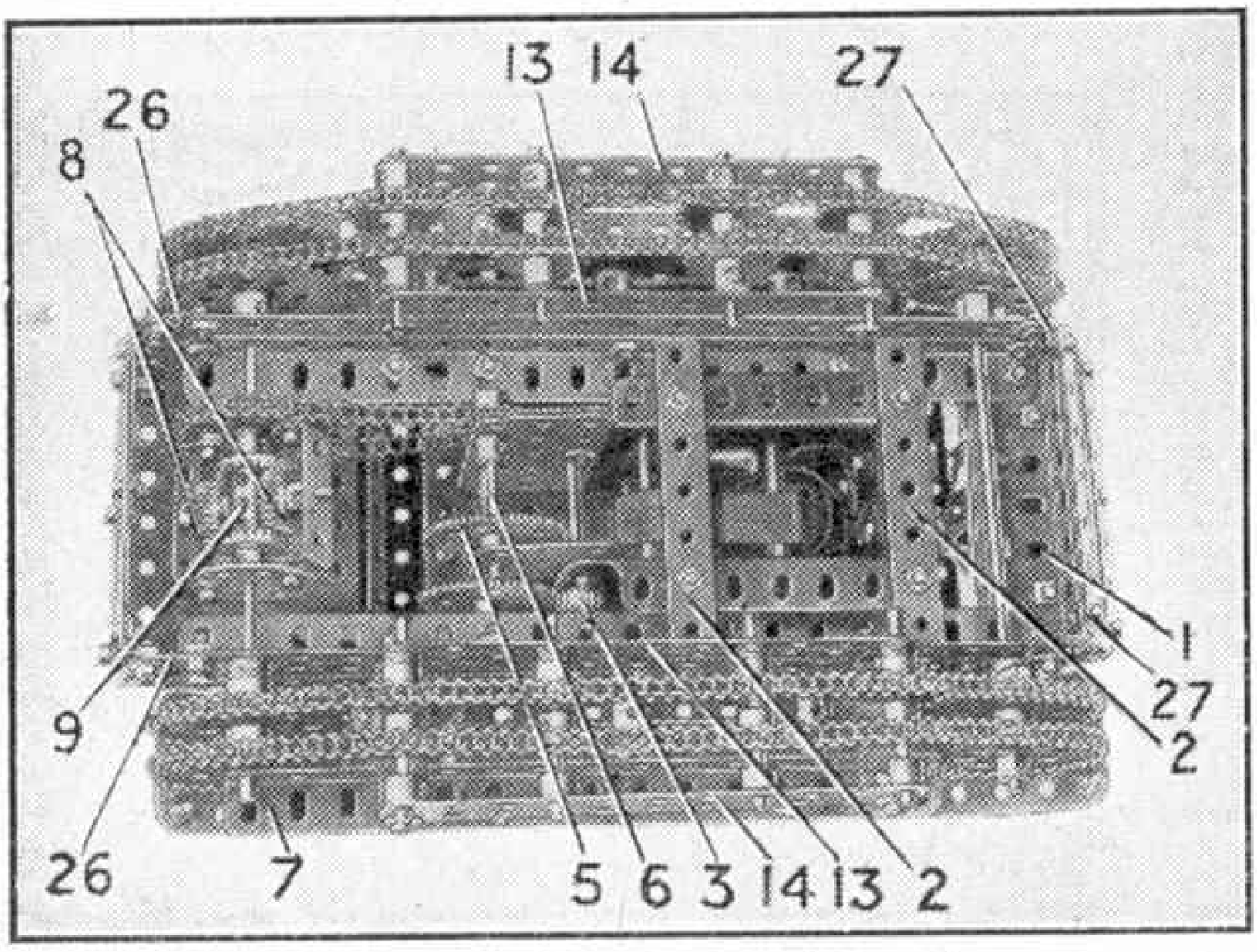


Fig. 2. An underneath view of the tank.

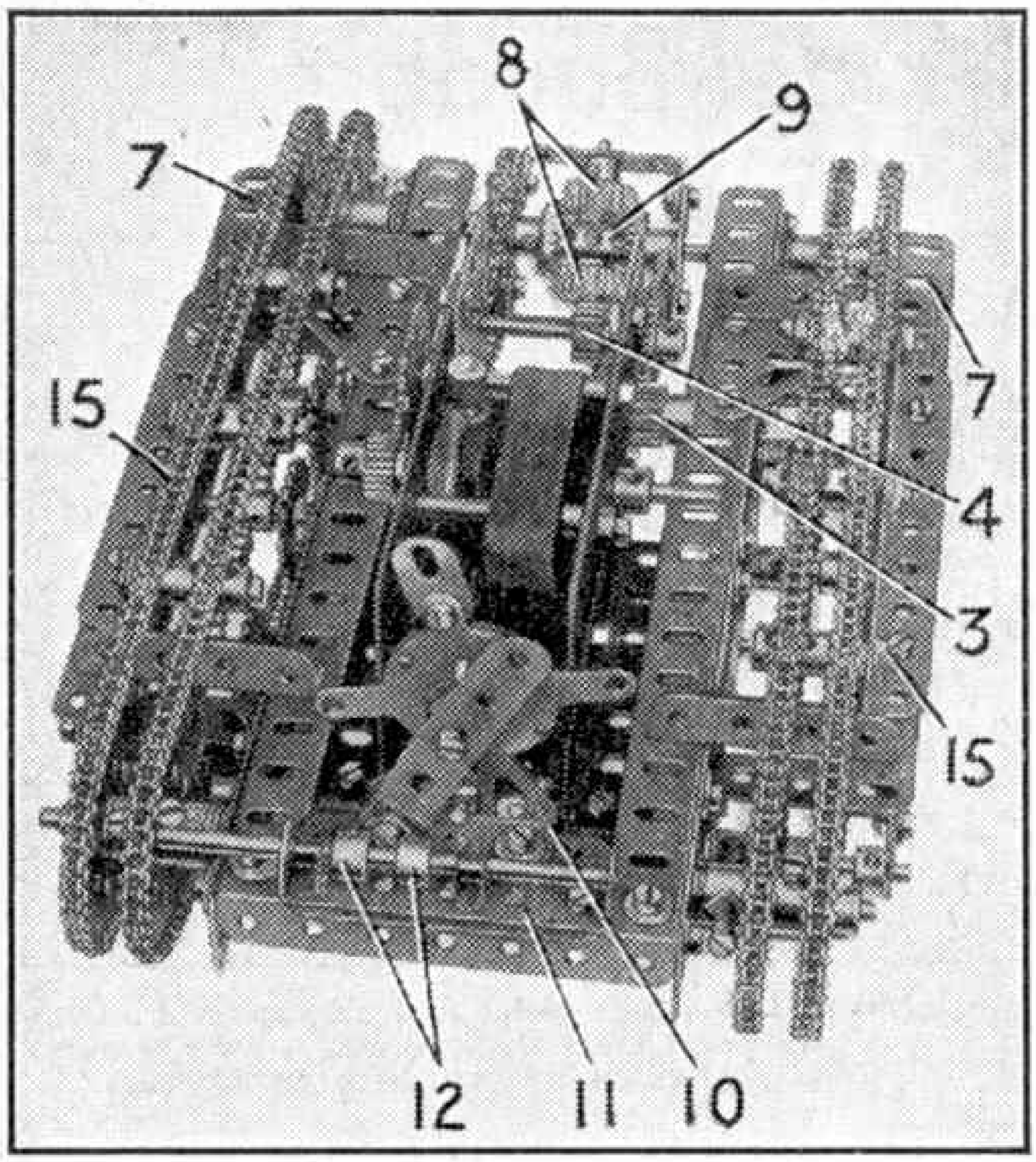


Fig. 3. A front end view of the tank chassis showing the Motor switch and the control for the tracks.

through the differential to steer the model in the desired direction.

The model is supported on four sets of idler sprockets on each side. Each set consists of two 1" Sprockets fixed on a 2" Rod mounted in two 5½" Flat Girders 13 and 14. Flat Girder 13 is bolted direct to one of the 9½" Flat Girders of the chassis, and Flat Girder 14 is attached to two 1½" × ½" Double Angle Strips fixed to the chassis. The Sprocket Chain representing the tracks passes round the 1" and 2" Sprockets, and is supported at the top by three rollers, each consisting of a Coupling loosely mounted on a 1⅛" Bolt. The Bolts are attached by nuts to 4½" Angle Girders 15 bolted to Girders 7.

The body is assembled as a separate unit and is fixed in position when the chassis is complete. The sides are 5½" × 1½" Flexible Plates bolted to 7½" Angle Girders 16, and braced along their upper edges by 5½" Strips. The sides are spanned by 3½" × ½" Double Angle Strips 17, 18, 19 and 20, Fig. 4. The sloping ends are provided by two 2" Slotted Strips 21 and two 2½" Strips 22. These are bolted to the upper corners of the 5½" × 1½" Flexible Plates, and to the ends of the Girders 16.

The rear of the body is completed by two 2½" × 1½" Flexible Plates 23, overlapped three holes and bolted to a 3½" × ½" Double Angle Strip fixed between Girders 16. A 3½" × 2½" Flexible Plate, braced by 2" Angle Girders 24, is attached to the Plates 23 by Obtuse Angle Brackets, and the rear edge of the 3½" × 2½" Flexible Plate is braced by a 3½" Angle Girder 25. The latter is extended downward by two 2½" × 1½" Flexible Plates overlapped three holes and edged by two 1½" Angle Girders and a 3½" Strip. The front of the body is completed as shown in Figs. 1 and 4, and the top is filled in by a 5½" × 3½" Flat Plate fixed to Double Angle Strips 17.

The track covers are 5½" × 1½" Flexible Plates edged by Strips and bolted to Girders 16.

The sides of the turret are made from one 3½", one 3" and two 1½" Strips, and a 2½" Flat Girder. The ends are 2½" × 1½" Flanged Plates and the top is made from two 2½" × 2½" Flat Plates overlapped four holes. The top is fixed to 2½" × ½" Double Angle Strips bolted between the sides. The gun consists of Couplings fixed on a Rod held in a Rod Socket.

The turret swivels on a Rod fixed in a Bush Wheel attached to the top of the body.

A Collar is fixed on the Rod underneath the turret so that it is held clear of the bolt heads in the 5½" × 3½" Flat Plate forming the top of the body. A second Collar on the Rod is used to hold the turret in position.

The complete body is attached to the chassis by Fishplates 26 and Angle Brackets 27 (Fig. 2.).

Forward and reverse drives are obtained by operating the E20R Motor reversing switch, which is extended by a Fishplate that projects through a slot in the body. The steering lever in its central position allows both tracks to be driven at the same speed, but when the lever is moved sideways one or other of the tracks is prevented from turning. The free track is then driven at increased speed through the differential mechanism and the model will pivot on the stationary track.

It is important to make sure that each track Chain has exactly the same number of links. The teeth of the Sprockets fixed on the driving and idling axles should be in line.

Parts required to build the model Light Tank: 6 of No. 2; 7 of No. 3; 2 of No. 4; 5 of No. 5; 2 of No. 6; 13 of No. 6a; 2 of No. 8a; 4 of No. 8b; 2 of No. 9a; 2 of No. 9b; 6 of No. 9c; 2 of No. 9f; 3 of No. 10; 2 of No. 12; 6 of No. 12c; 1 of No. 14; 2 of No. 16; 2 of No. 16a; 2 of No. 16b; 12 of No. 17; 1 of No. 24; 2 of No. 25; 3 of No. 26; 3 of No. 27a; 2 of No. 29; 2 of No. 35; 141 of No. 37; 27 of No. 37a; 95 of No. 38; 6 of No. 48; 3 of No. 48a; 10 of No. 48b; 2 of No. 51; 1 of No. 52a; 2 of No. 55a; 15 of No. 59; 11 of No. 63; 2 of No. 72; 2 of No. 73; 2 of No. 94; 8 of No. 95; 1 of No. 95a; 16 of No. 96; 1 of No. 96a; 4 of No. 103; 2 of No. 103a; 3 of No. 103f; 2 of No. 103h; 5 of No. 111; 4 of No. 111a; 6 of No. 111d; 1 of No. 126; 2 of No. 133; 2 of No. 179; 8 of No. 188; 6 of No. 189; 1 of No. 190a; 1 of No. 219; 1 E20R Electric Motor.

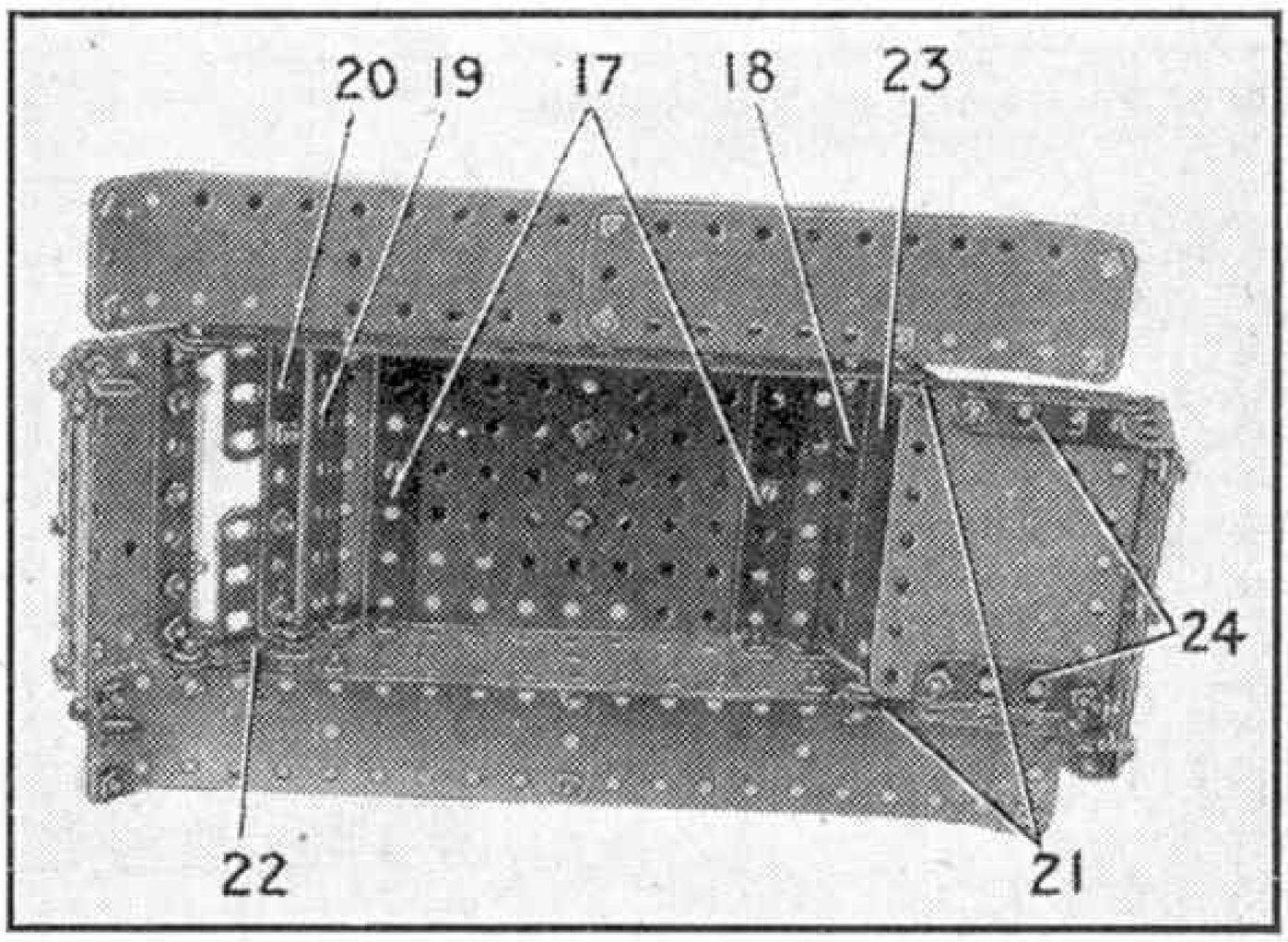


Fig. 4. The tank casing seen from the interior.

Among the Model-Builders

By "Spanner"

CENTRIFUGAL CLUTCH

Figs. 1 and 2 show a simple centrifugal clutch that can be incorporated in many models driven by an Electric Motor. A clutch of this kind takes up the drive only when the input shaft reaches a given speed, the actual speed being determined by the weight of the driving members and the strength of the springs used to hold them in the "off" position.

An E20R Electric Motor is bolted to a Flanged Plate 1, and a ½" Pinion on its shaft meshes with a 57-tooth Gear on a Rod 2 mounted in the Motor side-plates. Rod 2 is fitted with a Face Plate 3, and four ½" Pulleys 4 are mounted on 1½" Bolts free to slide in the slotted holes of the Face Plate. The Pulleys are fixed on the Bolts by nuts, and the Bolt shanks are passed through the slotted holes and are fitted with lock-nuts. Driving Bands are looped round opposite pairs of Pulleys so that they are pulled by the Bands towards the centre of the Face Plate.

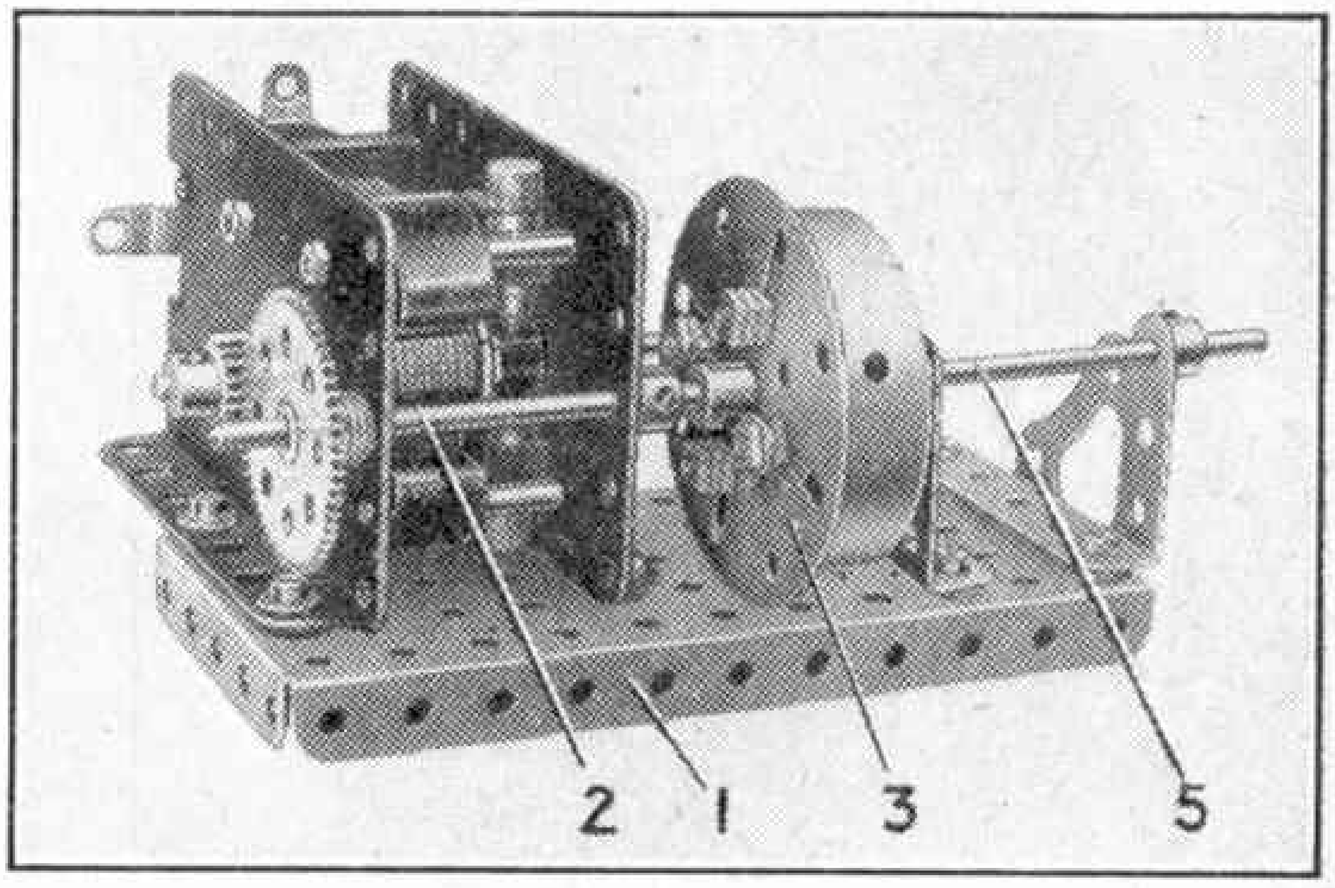


Fig. 1. A novel form of centrifugal clutch that takes up the drive only when the input shaft reaches a pre-determined speed. Details are given on this page.

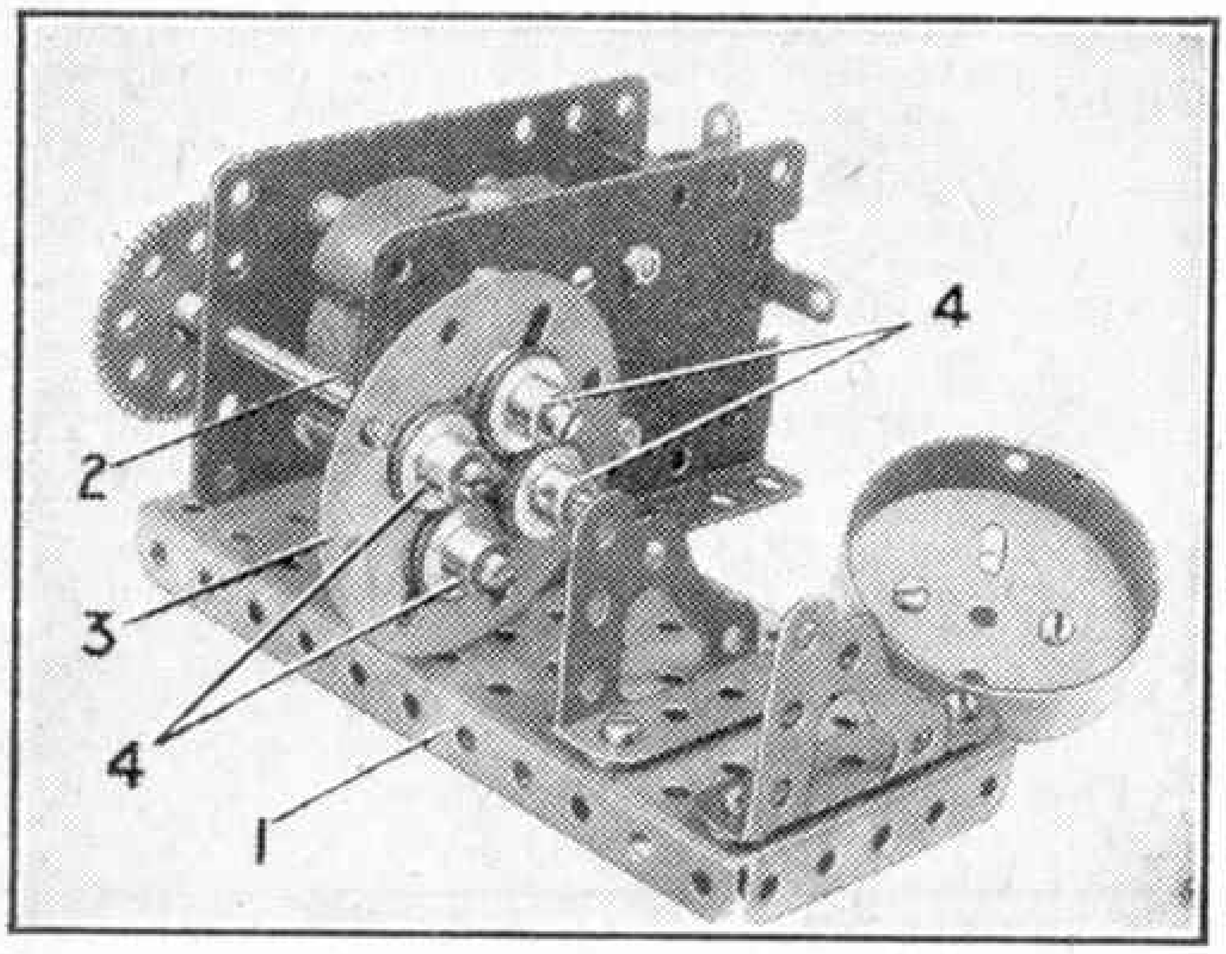


Fig. 2. The centrifugal clutch showing the interior construction.

The driven shaft is a Rod 5 mounted in Flanged Brackets fixed to the base. The Brackets are spaced from the Flanged Plate by Washers on each bolt to bring Rods 2 and 5 exactly into line. Rod 5 carries a Boiler End fixed to a Bush Wheel, and is positioned so that the Boiler End slips over the Pulleys 4.

A NOVEL USE FOR MECCANO GEARS

Mr. O. Roberts, Cardiff, has made use of Meccano Gears in a somewhat unusual way in a model ticket-issuing machine he constructed recently. The tickets in this machine are stored as a continuous roll of paper, and are issued by inserting a coin in a slot. Suitable paper for the job was obtained quite easily from stationers supplying rolls for adding and calculating machines, but it was found that when the ticket was torn off after issue a jagged edge resulted, and frequently the next ticket in the roll was spoilt by the tear. Some form of perforation similar to that used in postage stamps was obviously called for, and Mr. Roberts found that a Meccano 1½" Gear provided an easy solution to the problem. The Gear was mounted on a travelling arm and arranged to roll under fairly heavy pressure across the paper at the desired point, immediately before the ticket was ejected. The resulting perforations made by the teeth of the Gear allowed the ticket to be torn cleanly from the roll. The perforating action was found to be improved when a fairly resilient pad such as a sheet or two of blotting paper was placed underneath the roll at the point of contact with the Gear.

AN ITALIAN BOY'S BLOCK-SETTING CRANE

The lower illustration on this page shows a young Italian model-builder and a giant block-setting crane he built recently. This keen Meccano user is the nine-year old son of Ing Maggi Giuseppe, Milan, and he is to be congratulated on having completed so early in his career, a complicated model of this kind.

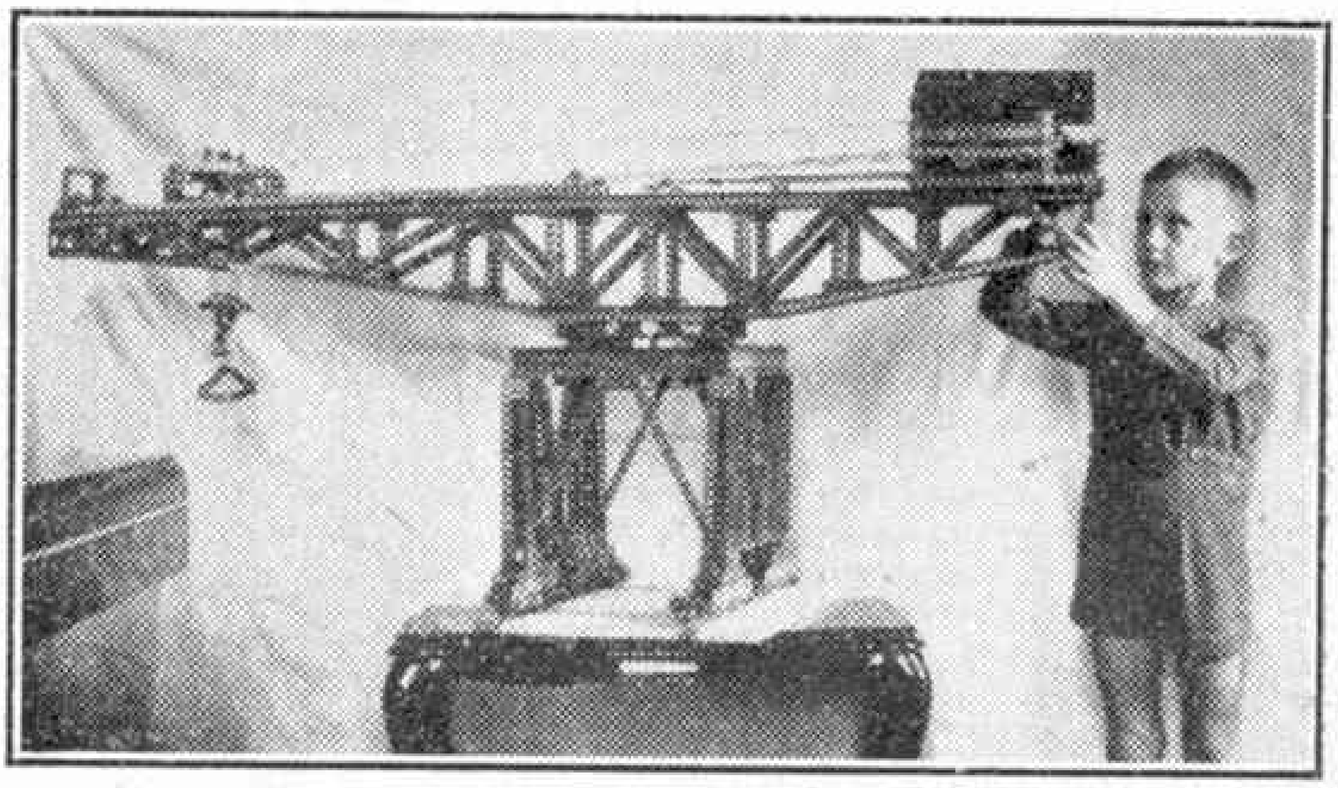


Fig. 3. Ing Maggi Giuseppe, Milan, and his young son are keen Meccano enthusiasts, and in this picture we see the boy putting the finishing touches to a model of a giant block-setting crane.

A New "Lynx-Eye" Puzzle Contest

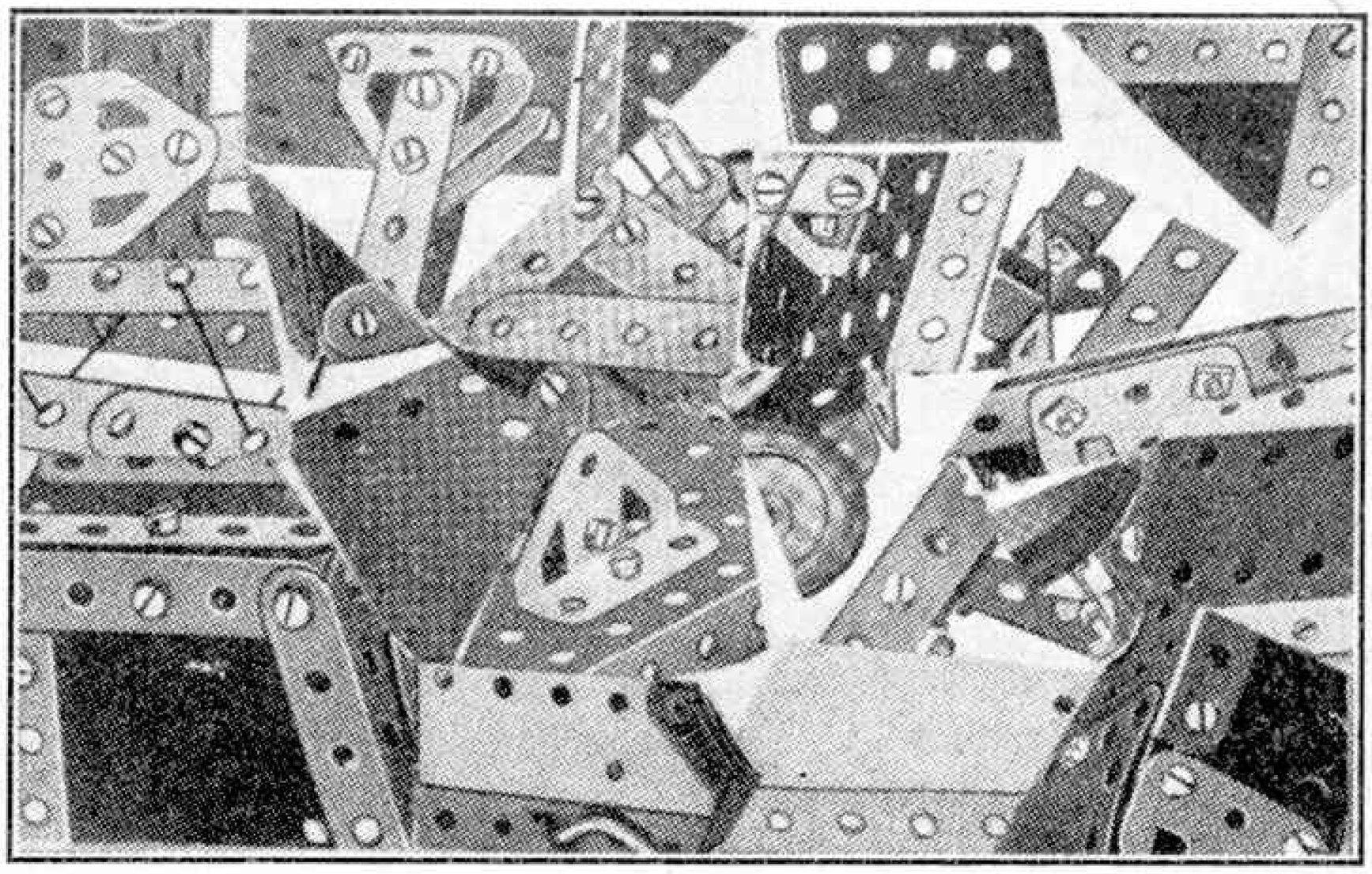
The curious illustration on this page is made up from a number of scraps cut from illustrations of models in the Meccano No. 4 Instructions Book. Readers are invited to study the illustration carefully and then write down on a postcard first *the Book model numbers, and then the names of the models,* from which are cut the various pieces that together make up the illustration.

Although the task of identifying each fragment may at first glance appear very difficult, careful and methodical inspection of the Instructions Book will soon enable competitors to "spot" from where quite a number of the fragments have been taken. Previous contests of this kind have proved extremely popular. As there is no model-building to do, competitors can prepare their entries equally well while at home or on holiday, and we are hoping therefore that there will be a record number of entries.

Entries will be divided into two Sections, A, for competitors of all ages living in Great Britain, and B, for competitors of all ages living Overseas.

The prizes to be awarded in each Section of the competition to the competitors who identify the greatest number of fragments correctly, are detailed in the panel on this page.

Entries must be submitted on postcards only, and should be addressed: "*August Lynx-Eye Contest, Meccano Ltd., Binns Road, Old Swan, Liverpool 13.*" Entries for Section A must reach this office not later than 29th September, 1951, and those for Section B must arrive not later than 30th November, 1951.



It should be mentioned that the fragments used in the illustration are not necessarily printed in the same positions in the illustration on this page as they occupy in the Instructions Book.

Competitors should not be discouraged if they find that they cannot identify all of the fragments contained in the complete illustration. They may quite easily obtain one of the many prizes offered although their entries are not absolutely correct. If no competitor succeeds in solving all the pieces in the picture the prizes will be given to the readers who submit the greatest number of correct solutions. On the other hand if more than one competitor solves every fragment correctly the prizes will be awarded to the first all correct entries examined, and consideration will also be given to the neatness with which the entry is prepared.

AUGUST "LYNX-EYE" CONTEST

PRIZES OFFERED IN THIS COMPETITION

A separate and complete set of prizes as follows will be awarded in each Section, Home and Overseas, of the Competition:

First, Cheque for £3/3/–.
Second, Cheque for £2/2/–.
Third, Cheque for £1/1/–.
Five Prizes each consisting of a Postal Order for 10/6.
Five Prizes each consisting of a Postal Order for 5/–.

Model-Building Competition Results

By "Spanner"

"Winter" General Contest (Home Section)

THE full list of prizewinners in the Home Section of the "Winter" General Model-Building Competition is as follows:

First Prize, Cheque or £3/3/–: B. Minister, St. Leonards-on-Sea. Second Prize, Cheque for £2/2/–: S. Reid, Aberdeen. Third Prize, Cheque for £1/1/–: T. G. Bolton, Preston.

Prizes of 10/6: J. W. Westley, Sutton, Surrey; J. W. Taylor, Penrith, Cumberland; J. A. Heywood, Macclesfield; J. C. Gooderham, Bacton, Suffolk; G. Hyde, Llanelly, Carm.

Prizes of 5/–: E. H. Chandler, Stratford-on-Avon; G. P. Clark, Tavistock; I. R. Cooper, Worcester; G. F. Sturman, Northampton; I. D. Taylor, Oldham; C. A. Wadley, Reading.

The illustrations of some of the prizewinning models that appear on this and the opposite page give some idea of the interesting range of subjects that featured among the entries and the excellent standard of workmanship reached by competitors.

I have often spoken of the need for originality in choice of a subject for a competition model, and I think that B. Minister, St. Leonards-on-Sea, who won the First Prize, owes his success very largely to the fact that he bore this advice in mind when selecting his model for this Contest. It is an electric engraving lathe which produces pre-determined designs in finely engraved lines on metal. The kind of work produced by the real machine is sometimes seen on old fashioned watch cases and silver ware of various types.

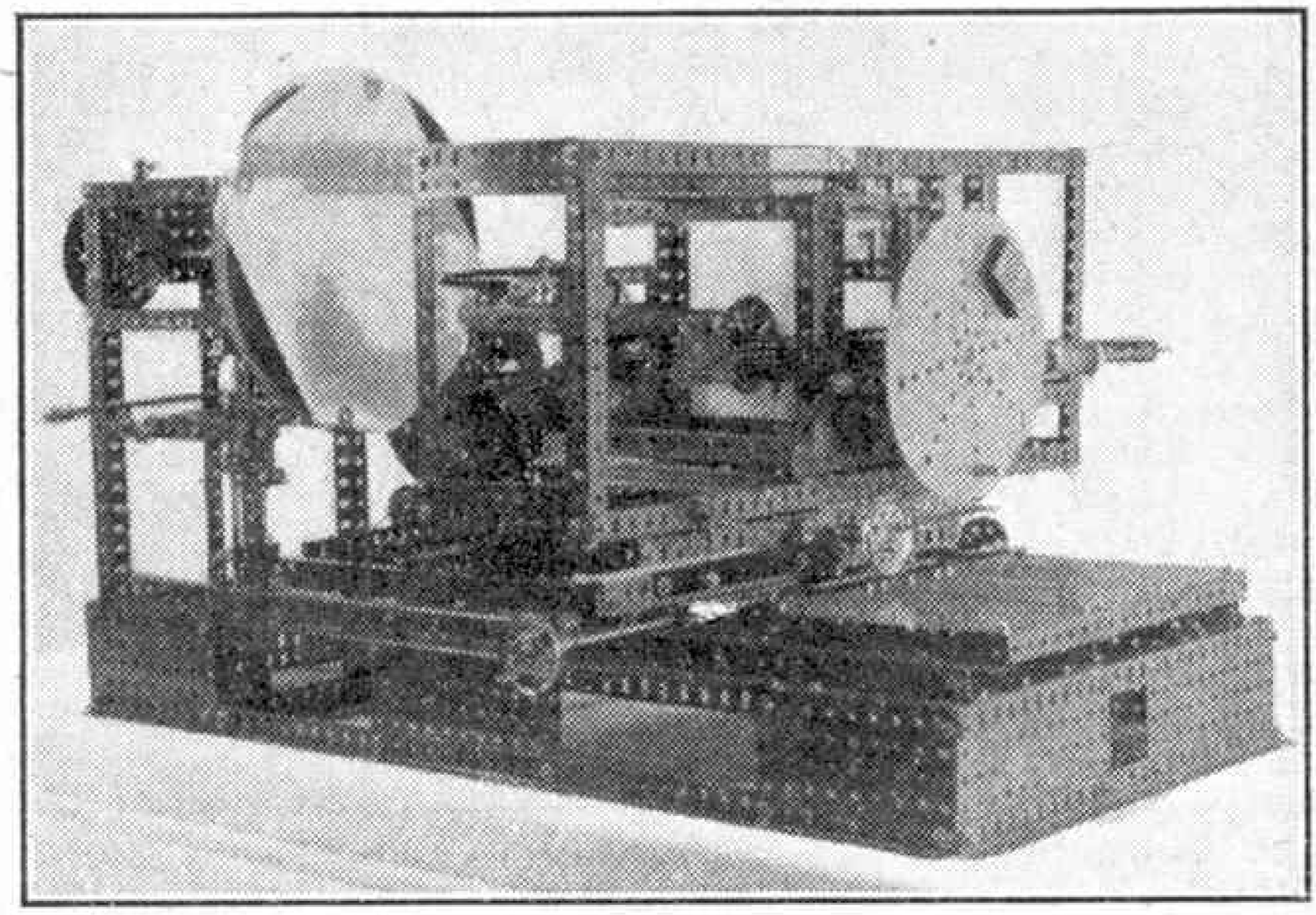


Fig. 1. B. Minister, St. Leonards-on-Sea, was awarded First Prize for this model engraving lathe, some details of which are given on this page.

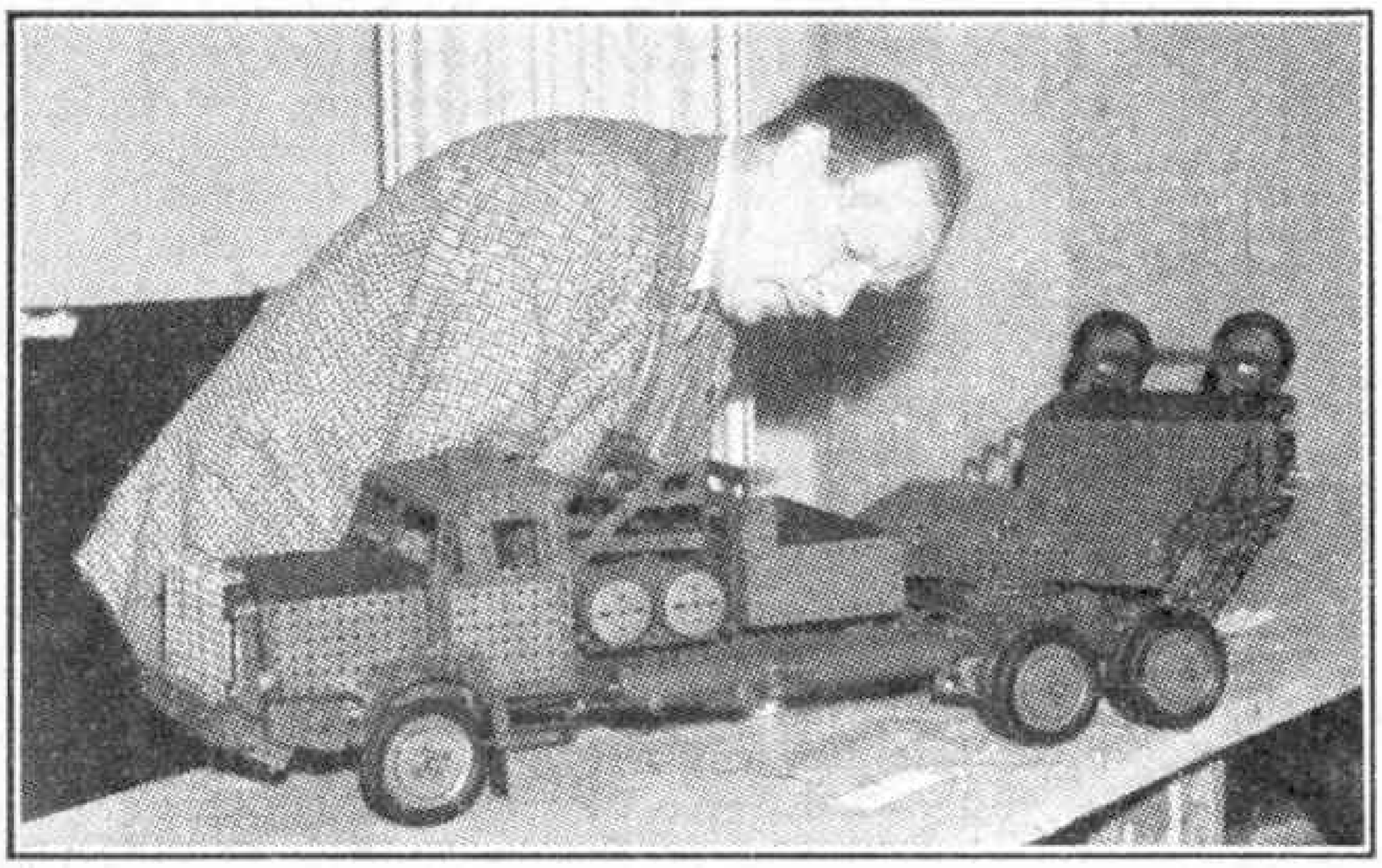


Fig. 2. Second Prize winner S. Reid, Aberdeen, photographed with his model of the Thorneycroft Mighty Antar Tractor and semi-trailer.

The machine operates on a somewhat similar principle to the Meccanograph, which will be familiar to most Meccano boys. It is indeed a Meccanograph built on the lines of a lathe, and one of its novel features is that complete circles of varying diameters may be drawn at any point either off the centre or on the centre of the

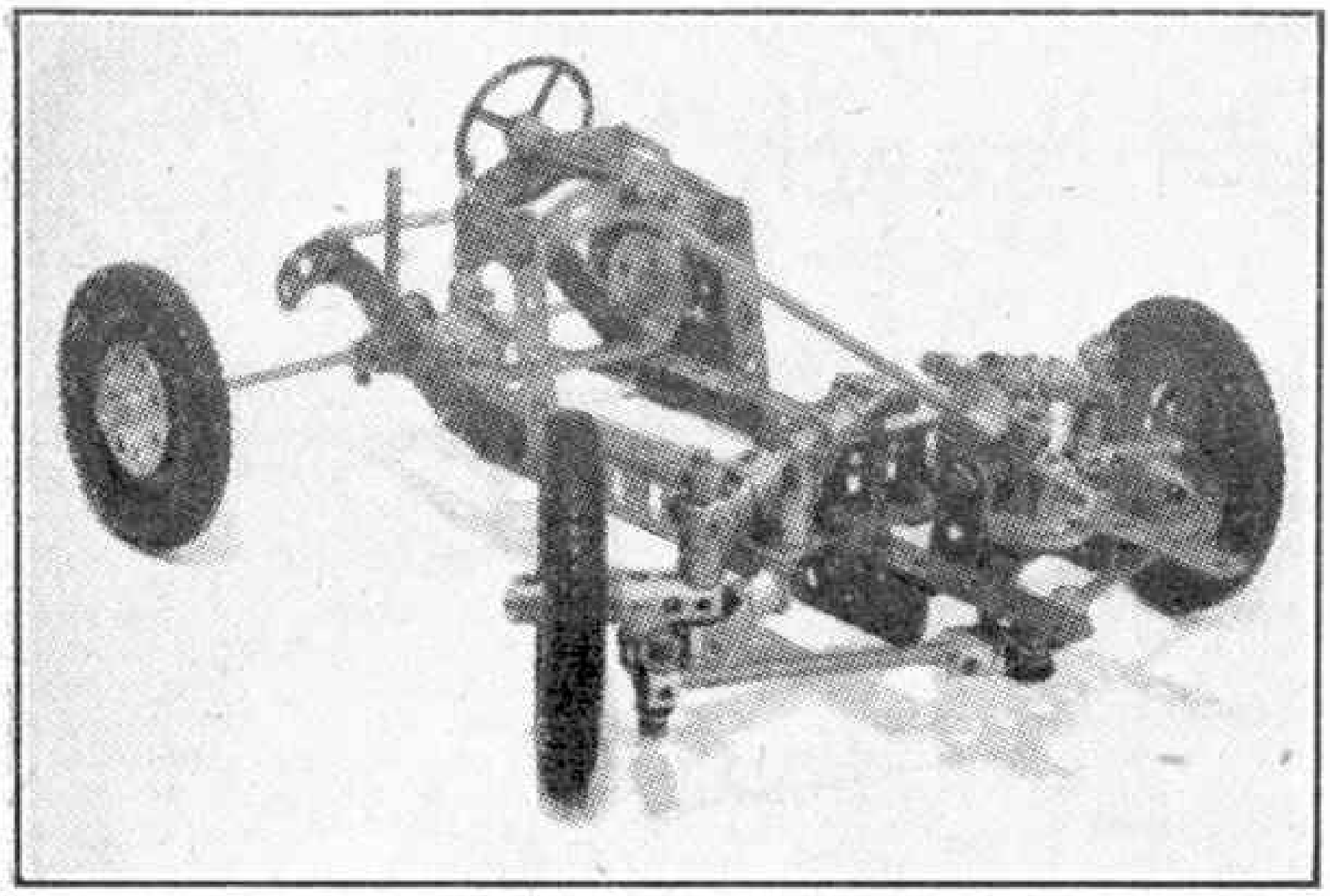


Fig. 3. The front wheel steering and suspension system of a model racing car built by J. W. Westley, Sutton, Surrey. Other parts of the car have been removed in this illustration.

designing table. Any number of such circles can be used to build up a wide variety of interesting and intricate designs.

It is impossible to give any useful constructional details here but I hope it will be possible to refer to this model again in a future *"M.M."*

Another entry of more than usual interest on account of originality is a 10 h.p. petrol engine modelled by J. A. Heywood, Macclesfield. This model is not so finely constructed as some others in the prize list, but its details show that considerable thought and care was taken to reproduce the original engine as accurately as possible with the parts available. The model is illustrated on this page. Heywood says that the timing of the engine was rather a problem at first, but he obtained a motoring paper and from the information given therein he finally managed to set the camshaft correctly to fire each of the four cylinders in the order 1,3,4,2. The engine is fully equipped with distributor, air filter, carburettor, fan and dynamo.

A non-working model of a racing car, the chief feature of which was independent front suspension with steering, brought a prize to J. W. Westley, Sutton.

John C. Gooderham, Bacton, near Stowmarket, sent a model of a Massey-Harris Combine Harvester driven by an E20R type Electric Motor. The model, which is shown in an accompanying illustration, was equipped with a workable cutting knife, sails,

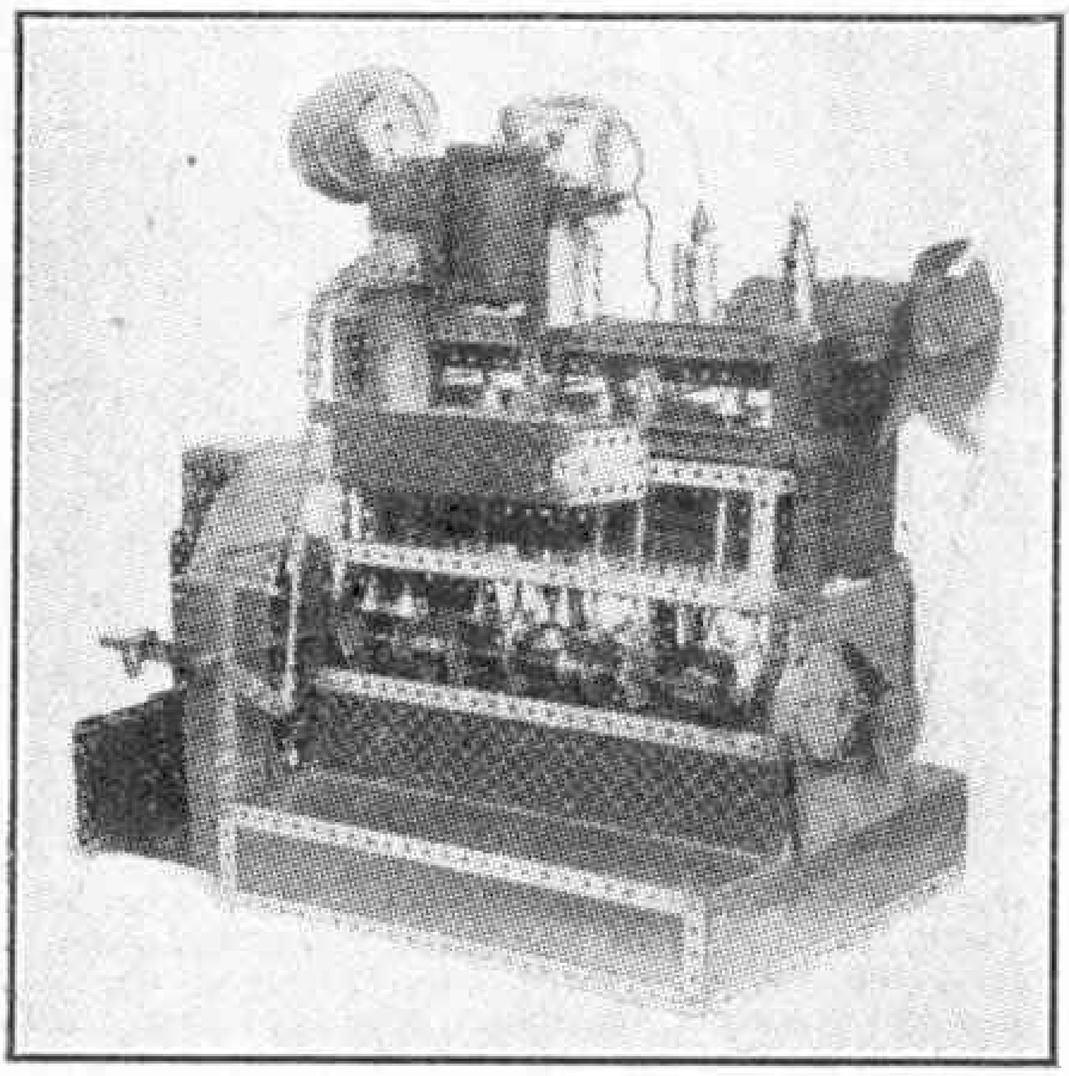


Fig. 4. This four cylinder petrol engine is the work of John A. Heywood, Macclesfield.

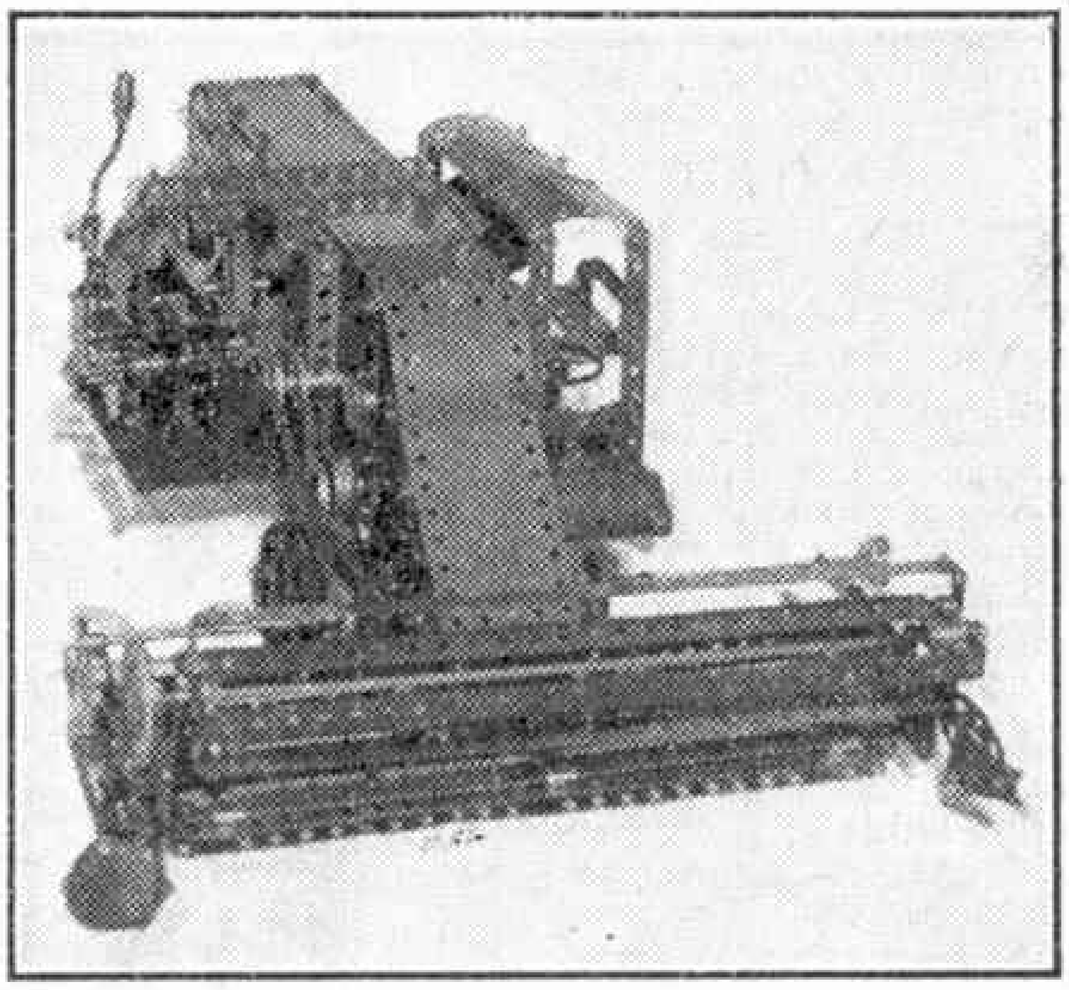


Fig. 5. A Massey-Harris Combine Harvester built by John C. Gooderham, Bacton, Stowmarket.

shakers, beaters, riddle and a straw baler. The model is an excellent one of its type, and I understand that it may possibly be exhibited at the Royal Show at Cambridge.

Another model of an unusual type is a miniature of a giant astronomical telescope and its ingenious mechanical mounting. It was built by G. P. Clark, Tavistock, and has many features and constructional details of interest.

Club and Branch News

WITH THE SECRETARY

FOR BRIGHTER AND HAPPIER MEETINGS

By the end of this month it will almost be time to turn from the delights of excursions and outdoor games to the pleasures of Model-building and other Club Room activities. Club and Branch members will look forward to the change with great eagerness, and their hopes must not be destroyed. With this in mind plans for meetings should now be made by Leaders and other officials, in readiness for discussion at the general meetings at which the programmes for the winter sessions are definitely settled. Members themselves have ideas on the subject, and should be encouraged to talk about these, so that the aims and ambitions of all of them can be satisfied as far as possible. Meetings are happiest and most productive of good results when all are agreed on what should be done at them.

Another point for consideration is the state of the Club or Branch Room. A meeting place that is untidy and unattractive acts as a damper on enthusiasm. Now is the time to clean up, and to make the accommodation not only practical in character, but bright and attractive in appearance. Stocks of Meccano parts should be carefully overhauled, and in Branches it is absolutely necessary to make sure that the track is in good order and that locomotives and rolling stock too will do what is asked of them. A little preparation of this kind will go a long way towards ensuring a successful return to Club and Branch Room activities.

A FORTHCOMING EXHIBITION

An Exhibition arranged by he Mile End (Portsmouth) M.C. will be held in the Lecture Hall, Central Library, on the 14th and 15th of this month. It will be opened at 6.30 p.m. on the first day, closing at 9.30 p.m., and on the following day visitors will be welcome from 2 p.m. until 9.30 p.m. The charges for admission are 6d. for adults and 3d. for children.

The Mile End M.C. has already held many successful Exhibitions, and all Meccano and Hornby Train enthusiasts in Portsmouth and district should keep this event in mind.

CLUB NOTES

BELGRAVE UNION (LEICESTER) M.C.—Intense activity continues, with Meccano Model-building the chief activity. All models built are carefully studied, faults pointed out and improvements suggested. The Club's Hornby-Dublo Railway also is being developed. Special Talks have been given, including one by Mr. C. S. Smith, Leader, on the aims and ideals of the Club. Members not wearing badges on Club nights pay a fine of 1d. Club roll: 48. *Secretary:* E. J. Crossley, 22, Johnson Street, Leicester.

HORNSEA M.C.—Club models of a fuicular railway and the Forth Bridge have been completed, and other interesting models constructed. Talks and Film Shows have been enjoyed, and a mock Council election provided a very lively meeting. Club roll: 11. *Secretary:* R. Harris, Ty-Olaf, Victoria Gardens, Hornsea.

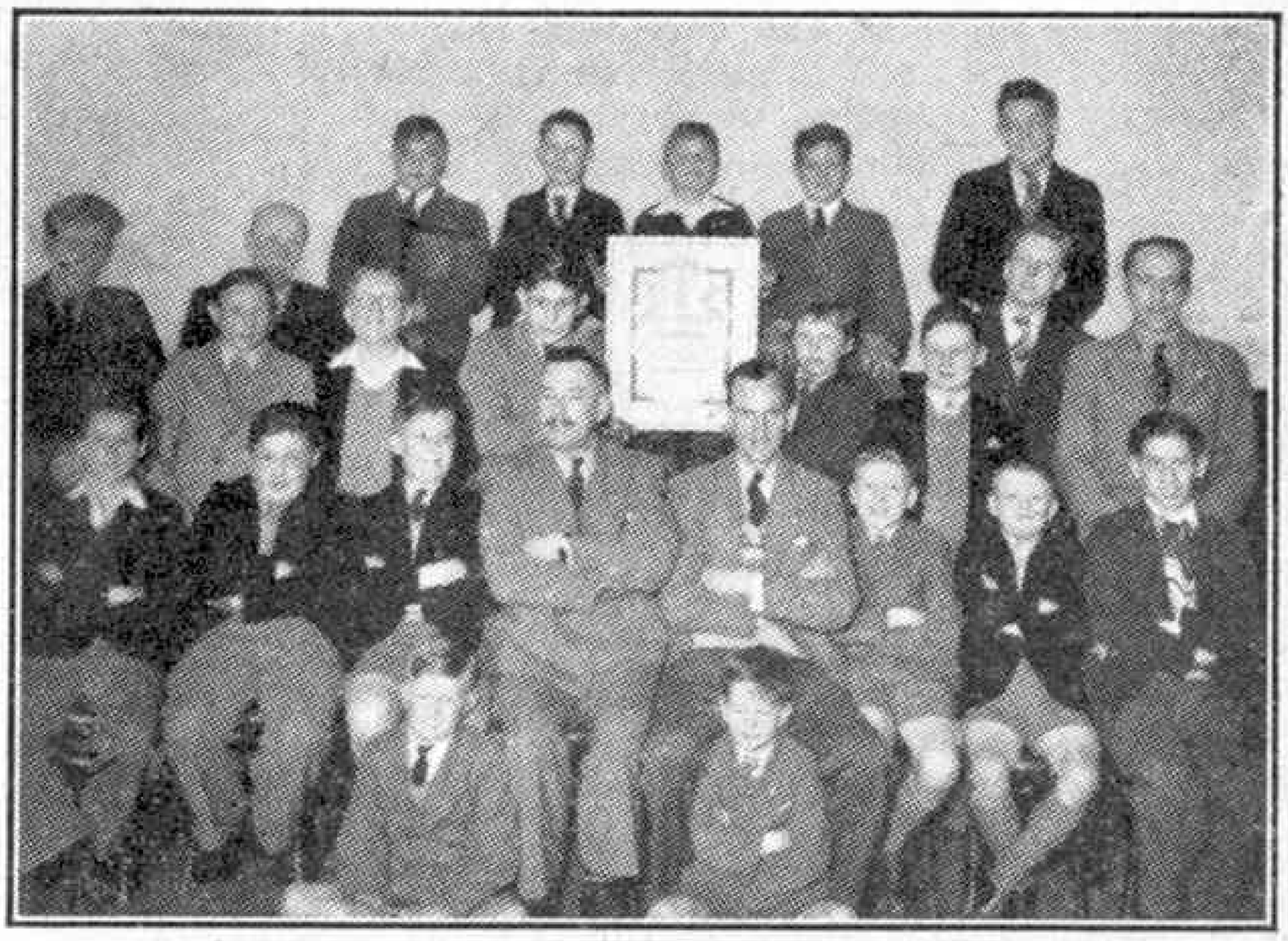
AUSTRALIA

MAYLANDS (PERTH) M.C.—A new Club feature is the "Rumpus Room." In this members "broadcast" short plays, sketches and monologues over a public address system, with sound effects. The Fretwork Section is very active, and a new activity is a Photographic Section, the members of which are practising developing and printing in the Club's darkroom. Model-building continues to take up most of the time at Club meetings, and successful Cycling Trips and other outings have been held. Club roll: 36. *Leader:* Mr. V. Malmgreen, 16, Kennedy Street, Maylands, Perth.

BRANCH NEWS

SOUTH CHINGFORD—The Secretary has built a bridge, and other members have been busy with track laying and repairing and with the construction of the control panel. A new siding has been laid out and a "Royal Scot" locomotive acquired. More members are wanted. *Secretary:* K. R. White, 136, Westward Road, South Chingford, London E.4.

NESSBANK (INVERNESS)—Track and Lecture Nights alternate. Shunting, main line working and signalling operations are practised on the former, and Lectures have included one by the Secretary on "*The History of Locomotion.*" Members are given facilities to learn soldering, casting and other operations by a model engineering club conducted by Mr. Macleay. *Secretary:* Ian Hay, "Lea Rig," Drummond Crescent, Inverness.



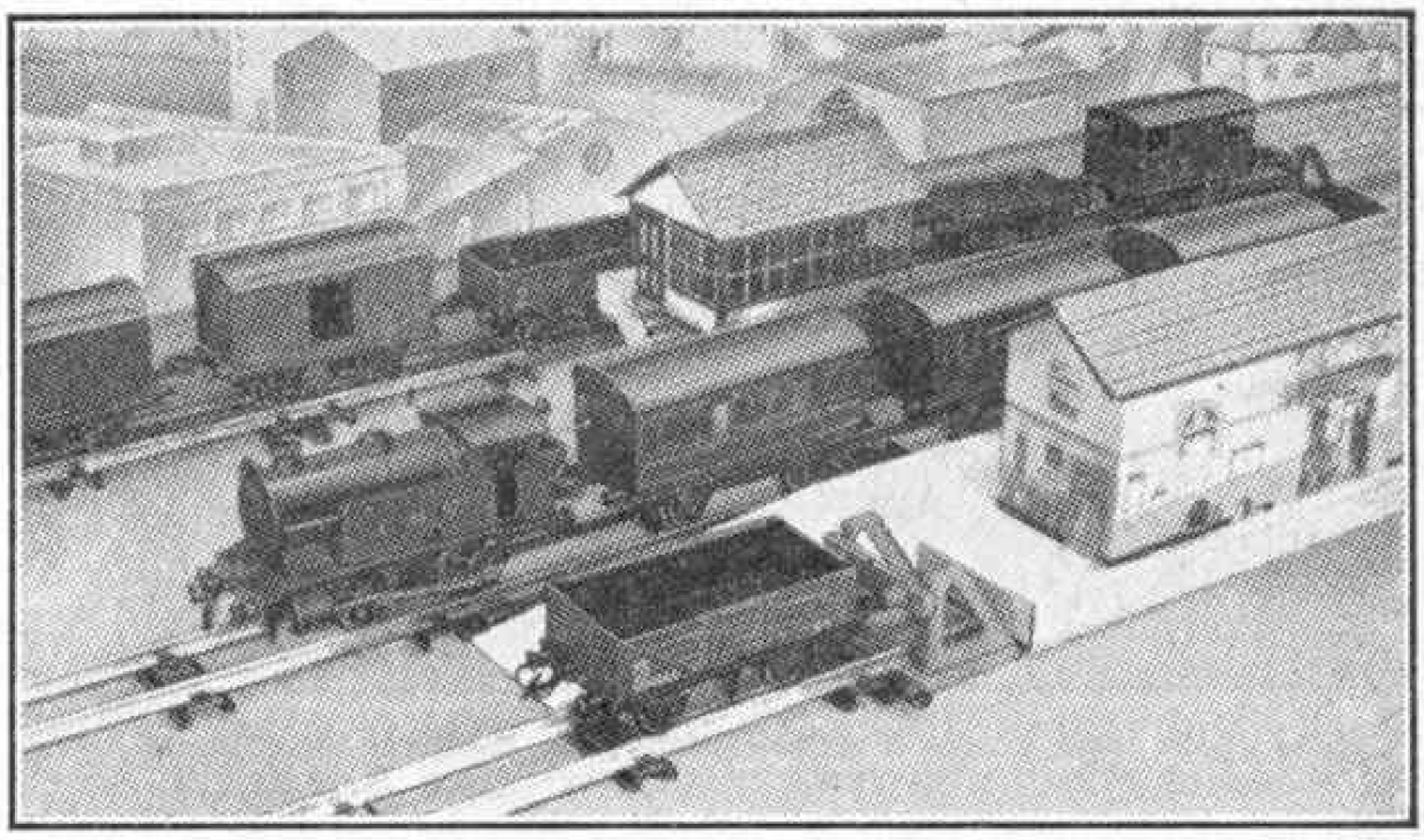
Officials and members of the Belgrave Union (Leicester) M.C. In the centre of the group are Mr. F. S. North, Hon. President, and Mr. C. S. Smith, Leader. Mr. E. J. Crossley, Secretary, and Mr. W. George, Vice-President, are on the left of the third row, and Mr. S. Cooper, Chairman, who is in charge of the Club's Hornby and Hornby-Dublo Railway activities, is on the right of the second row. The Club was affiliated with the Meccano Guild in April 1950, and quickly developed into a large and efficient Club, following a busy programme of Model-building and other activities.

Here and There on a Hornby Layout

THE plain track with which most Hornby railways begin soon becomes more like a railway if attention is given to different lineside matters, as suggested last month. Side by side with such improvements track extensions are usually planned, and these naturally influence the train running arrangements. We have seen before how sidings and loop lines fit into the running scheme; but their addition to the plain track has quite an influence on the appearance of the railway as well.

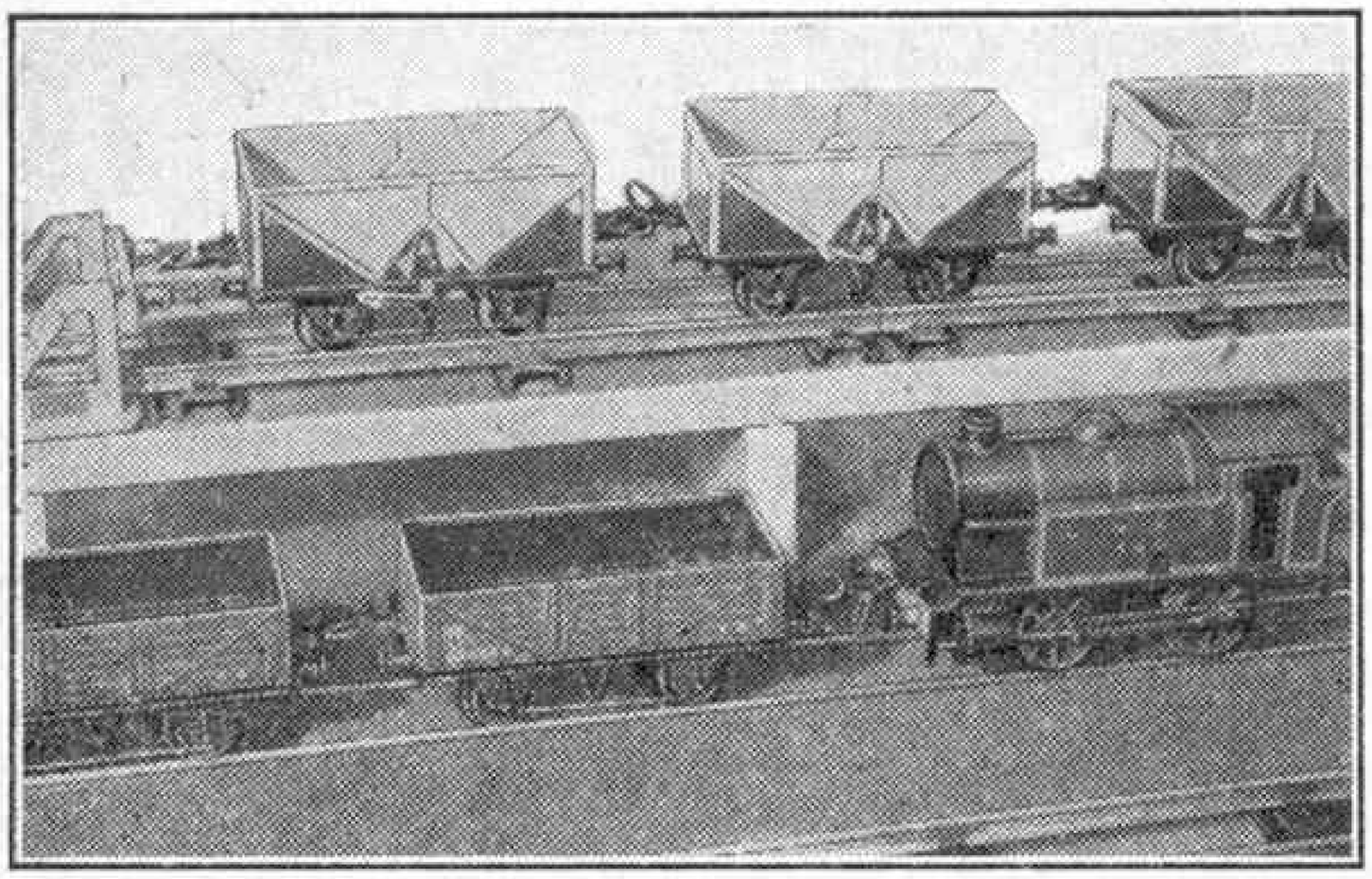
Sidings provide useful storage space for rolling stock, but loops that are used regularly for running purposes cannot very well be made to accommodate spare stock. A train that is standing ready made up, waiting for its engine, can stand in a loop as it will not usually be held there for very long. Occasionally a short siding near the station will be used for locomotive purposes, and when this is done there may be just room at the Buffer Stop end of the siding for an open wagon or two. Such vehicles can represent the "Loco Coal" wagons often seen on such real sidings. Alternatively they can be supposed to be waiting to be loaded with the clinker and ash that always accumulate where engines habitually stand.

An odd wagon next to the Buffer Stops does relieve the bareness of an otherwise empty siding, and if standing close to a station it can be supposed to be the station rubbish wagon. In actual practice this acts as a sort of a mobile refuse bin that is hauled away when full. In miniature, the engine key and similar oddments needed when train running is in progress can be kept in it so that they are handy near the station whenever necessary.



A stopping train hauled by a No. 101 tank leaving a Hornby Station. Note the empty vehicles in the picture, particularly the wagon in the foreground.

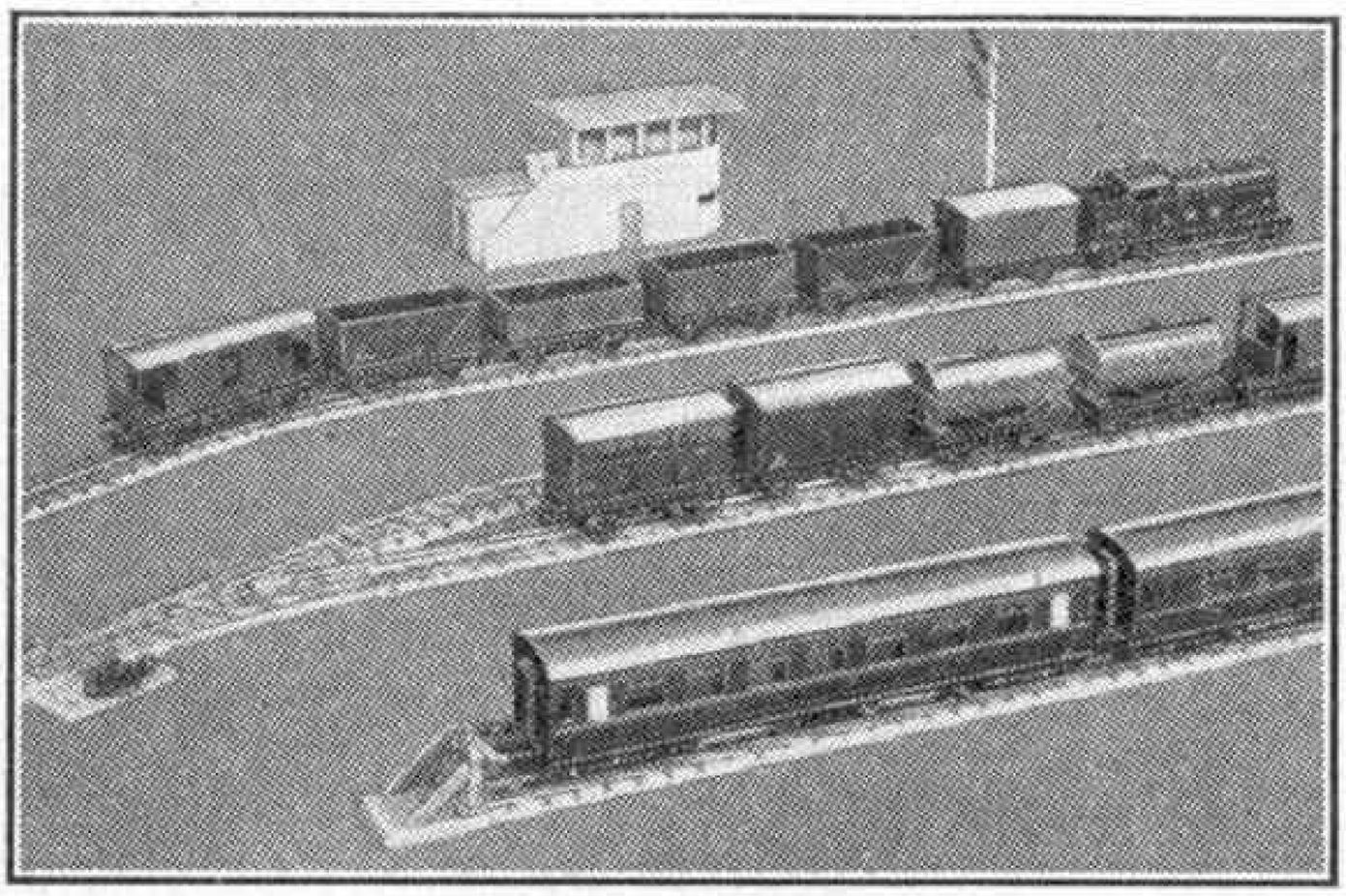
Another siding scheme that looks realistic is to stand a Goods Brake Van next to the Buffers. When standing there it should display a tail lamp at the end facing any approaching engine, that is at the end away from the Buffer Stop. The Van is not needed during shunting operations, but when these are over and the train is marshalled, there is the Van ready to be attached to the end of the train. Before the train leaves, the "Goods Guard" must see that the tail lamp is on its bracket at the rear and that the sidelamps are in position with their red "glasses" facing rearward. In addition, he should examine all the couplings.



Hornby Hopper Wagons on an elevated road for discharging purposes. Empty open wagons are standing on the track below.

Local Goods Trains in Hornby-Dublo

PLENTY of fun can be got from the running of local goods trains even with a small selection of rolling stock. Trains of the type that we wish to talk about can vary in their make-up, and the exact arrangement of the wagons in the train can be changed according to circumstances.



A local goods train passes a signal cabin on a Hornby-Dublo layout. A mixed collection of stock is standing in the loop road.

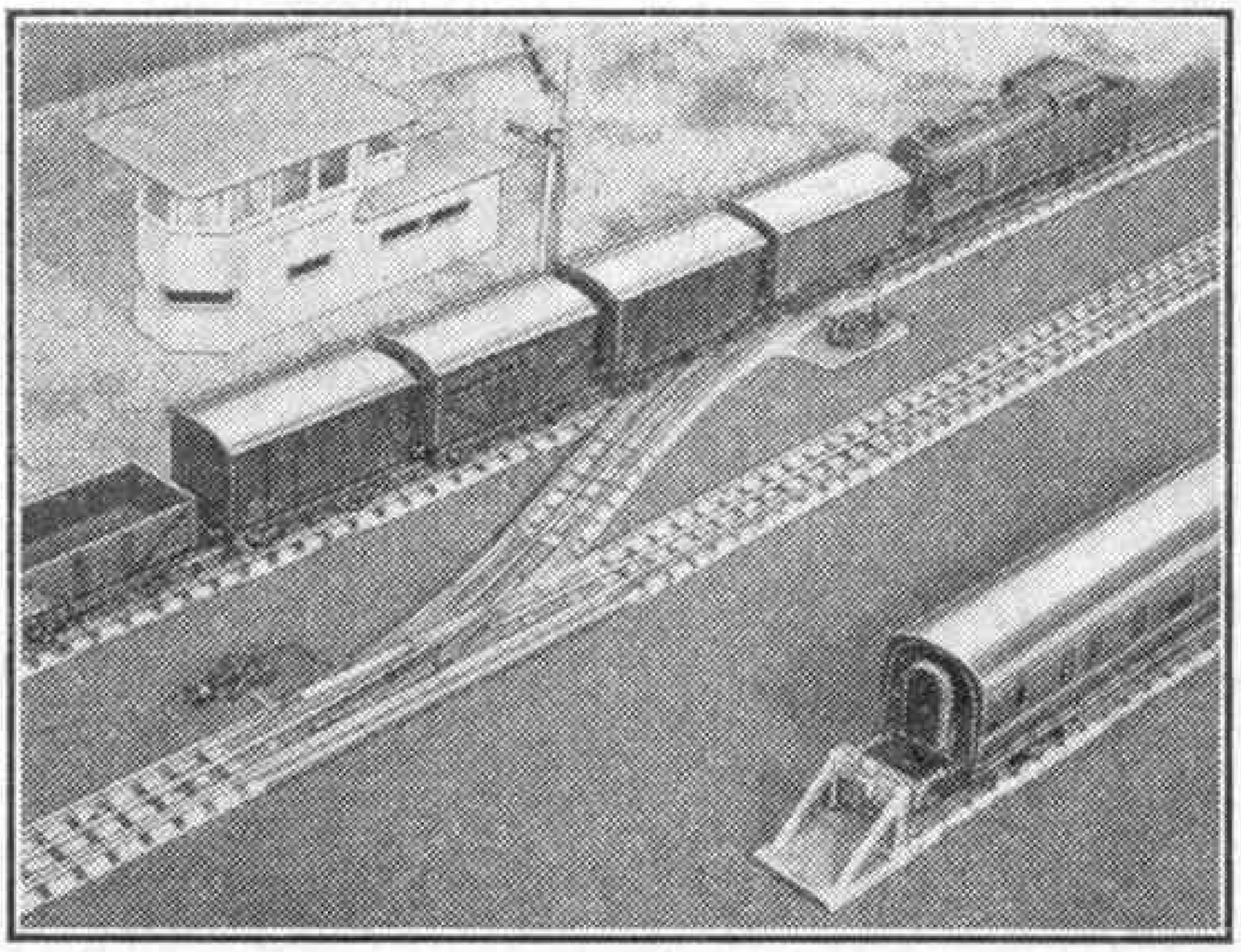
Ideas may differ as to the type of layout required. In general, however, if there is the usual continuous oval main line with a loop and a couple of sidings, this arrangement has quite interesting possibilities. Naturally, Uncoupling Rails will be necessary too, but the exact number of these will vary on individual layouts.

Where trains normally travel in one direction only on the main line the layout can be simplified by the omission of the loop line if necessary. The siding points have to be laid in a trailing direction to the main line; that is to say an engine has to reverse to push its wagons into the siding. A loop line is required when trains run in each direction on a single main line. An engine approaching the siding points in a facing direction will then bring its train to a stop, uncouple, and then run round to the other end of the train. It is now in a position to carry out its shunting.

A train may begin assembled in any order, and the first job on arrival at the sidings will be to sort the vehicles. We can aim for instance, at getting the vans in the train in a group next to the engine. Similarly tank wagons usually run together, and if they are supposed to be loaded they should be about the centre of the train.

Once we have the train made up in this way we can let it run for several circuits round the main line. Then the next time it arrives at the sidings we can make it put off a couple of vehicles. If these are both of the same kind the job is fairly easy. If a van, tank wagon and an open wagon each have to be put off, a little more manœuvring is necessary. Further variations are possible by arranging for wagons put off in this way to be picked up again at a subsequent call at the sidings.

The Goods Brake Van must occupy its correct position in the rear of any re-marshalled train when shunting is over. It may therefore have to take part in various vehicle movements, unless an Uncoupling Rail in the main line or loop allows it to be left temporarily on either of these tracks while shunting is going on.



Crossover points join the up and down main lines on a Hornby-Dublo layout. The goods train is drawing ahead ready to be shunted through the crossover into sidings on the near side.

An Effective Portable Hornby-Dublo Layout

APPROPRIATELY for this holiday month the picture on this page shows three Hornby-Dublo railwaymen in the garden with their layout. These fortunate enthusiasts are Derek, Colin and Roger Wills, of Bournemouth, for whom their father, Mr. T. P. Wills, who is an equally keen Hornby-Dublo engineer, has provided a substantial and well-arranged baseboard for their railway.

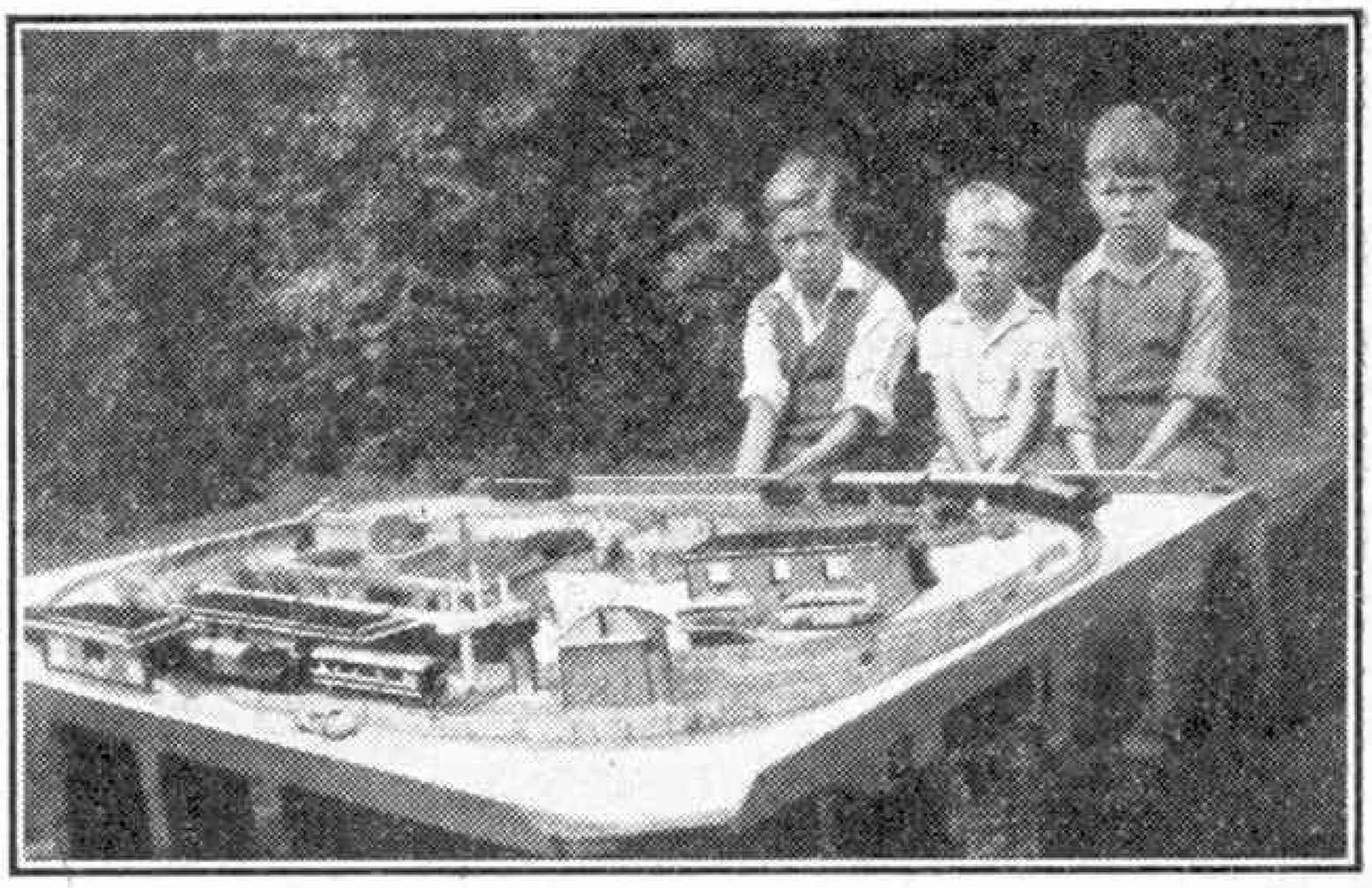
Normally when required for use the complete board is laid on top of a table indoors. The track and buildings are fixed to the board so that on a fine dry day it is an easy matter to transfer the complete system to the garden. Then when it is not required the trains and the vehicles that belong to the layout are packed away and the board is stood on end against the wall.

The board measures 7 ft. by 4 ft. so that there is a reasonable amount of space for the continuous main line. Although it is a single track there is an inner loop serving the main platform of the principal station. Alongside this loop is a terminal road and between this and the outer main line is an island platform also forming part of the main station. These platforms are joined by a footbridge. A goods depot outside the main line is served by a further dead-end road. The station just described can be seen in the left foreground in the picture on this page. The building immediately opposite the corner of the board facing the camera is a signal cabin. There is another station, a simple one-platform affair, at the opposite side of the layout; that is, immediately in front of the three boys in the photograph.

For the size of the layout there is plenty of equipment. Passenger traffic is provided for by eight Hornby-Dublo L.N.E.R. Coaches and there are thirteen goods vehicles of various types. As is fitting on a "country" layout of this kind two of the three engines are tanks of the standard Hornby-Dublo 0–6–2 variety. These handle local passenger and goods traffic and carry out any shunting that is necessary. For long-distance work there is a "*Sir Nigel Gresley*" 4–6–2 tender engine. In connection with the express trains more varied running is made possible for them during their journeys by the occasional use of the loop line referred to previously.

A special feature is made of road traffic in conjunction with the railway and a bus depot is a prominent building in the centre of the layout. Road motor services are provided by two Dinky Toys Double Deck Buses and two Single Deck vehicles. Miniature cars and various commercial types add to the road traffic and in order to help its control there are traffic signals at appropriate points. Opposite the road entrance to the main station there is a traffic island. To avoid road traffic being completely enclosed within the rail layout there are two level crossings, one at each end of the main track. These crossings are not provided with gates but there are the usual appropriate warning notices.

Miniature fields lie alongside the track and in addition to the usual railway buildings the layout includes a miniature farmyard with house and buildings. All the buildings, railway and otherwise, were built at home by Mr. Wills using cardboard and the familiar commercially-produced brick paper.



A happy trio of Hornby-Dublo engineers. Derek, Colin and Roger Wills, of Bournemouth, in the garden with their portable layout.

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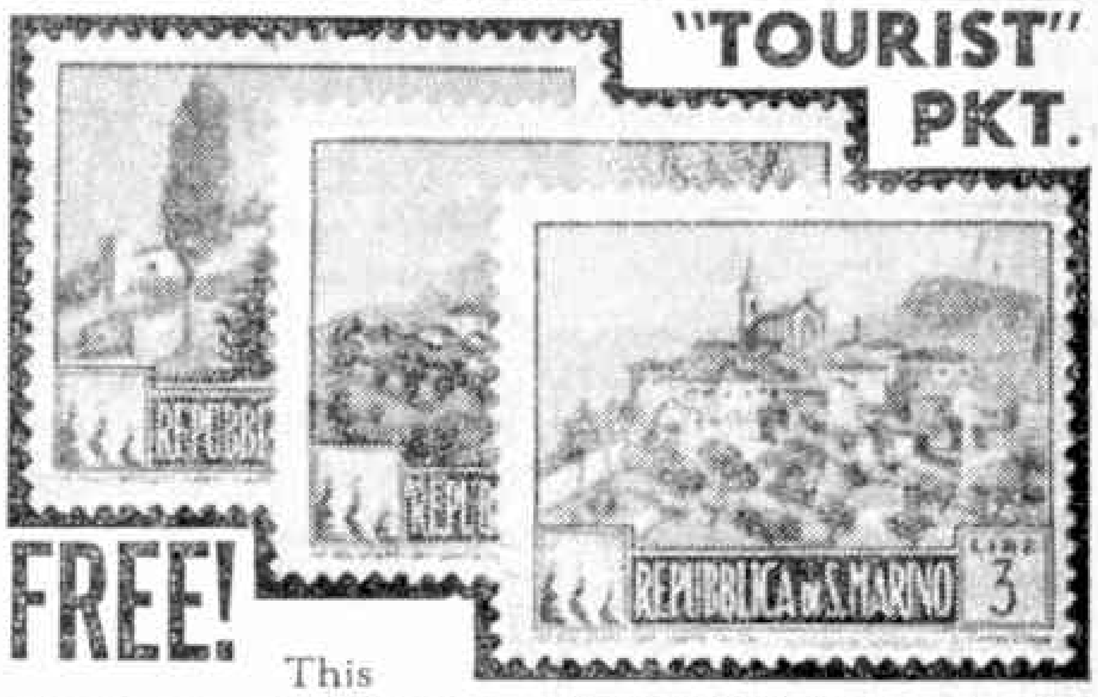

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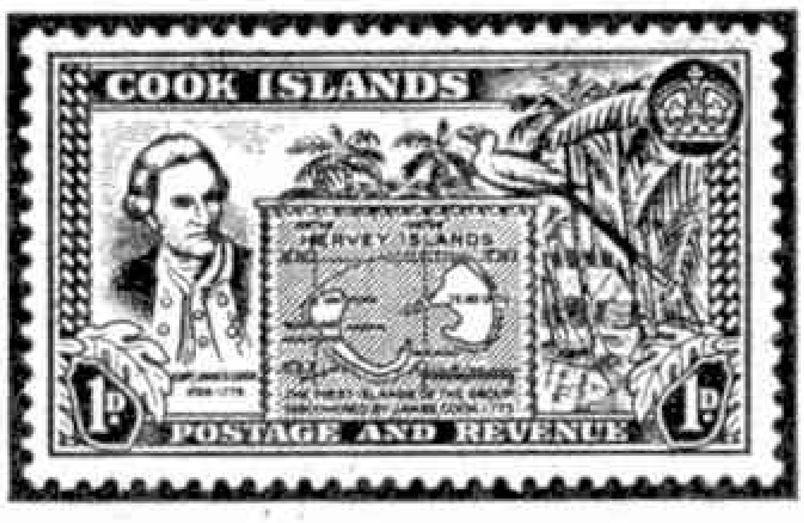
A Great Explorer

By F. Riley, B.Sc.

WHEN Colombus first sailed west across the Atlantic, and when Captain James Cook began his famous voyages in the South Seas, neither could have realised that in the years to come their exploits would be commemorated on a large scale on little pieces of gummed paper. Stamps were then unthought of; since their appearance, and the introduction of pictorials and commemoratives, the portraits of the two mighty explorers have appeared on them more often than those of any other individuals apart from Kings, Presidents and other heads of States.

Many stamps bearing portraits of Colombus have been issued in American countries, and he has been honoured also in Spain, the country from which he sailed. The stamps commemorating the discoveries of Cook have been restricted to the scenes of his discoveries, for commemoratives of this kind are not issued in Great Britain, the home of this famous navigator. He was born in the village of Marton, Middlesbrough, where his father was an agricultural labourer. The cottage in which he began life is still in existence, but now it stands in Fitzroy Gardens, Melbourne, as a monument to the first Englishman to set foot on Victorian ground.

At sea Cook started with a humble place on board a coasting vessel. Later he joined the Navy, and soon attracted attention by his skill and initiative. He surveyed the St. Lawrence River during the campaign in which Wolf captured Quebec, and then went as surveyor to the rocky and dangerous coast of Newfoundland. While there he carried out observations on an eclipse of the Sun with so much skill that two years later he was selected to lead a scientific expedition to Tahiti in the Pacific Ocean.



This selection was the beginning of the marvellous series of voyages in the course of which Cook landed in New Zealand—the first European to do this—and on the east coast of Australia, which he explored along its entire length. That great Continent had been seen by earlier navigators, but Cook was the first to reach its east coast and to recognise its suitability for Europeans. He gave the name New South Wales to the land he discovered, hoisting the British flag over it, and the first Cook stamp portrait to appear was issued by this State in 1888 as the 4d. value in a set celebrating its centenary.

More Cook stamps appeared as commemoratives became more popular, especially in New Zealand. The

explorer's connection with this Dominion was a close one. He was the first to realise that it consisted of two islands, and the stretch of water between them is called Cook Strait after him. He visited the country on each of his three great voyages. The first direct New Zealand Cook stamp appeared in 1906 and illustrated his pioneer landing, but there had been an indirect reference to him in New Zealand stamp history several years earlier in the form of two stamps picturing Mount Cook, which had been named after him.

Other Cook stamps followed, in New Zealand and in Pacific islands, and probably there are more to come, for the great navigator and pioneer of the Pacific can never be forgotten. This was demonstrated when the most recent Cook Islands set of 10 stamps appeared in August 1949, for two of these are Cook stamps. The 1/– value of the set reproduces a statue of Cook over a map showing the Islands themselves; the 1d. stamp carries a portrait of the explorer, with a map showing the Hervey Islands, which were actually discovered by him. The second of these two stamps also shows a bosun-bird or tavake, a handsome creature with long red tail feathers.

Rarotonga, one of the islands of the group, was not discovered until 1820, and was described three years later by the missionary John Williams, whose portrait appears on the 2d. value, reproduced on this page. This also shows a map of the island and "*Messenger of Peace*," built by Williams at Rarotonga in 1828. This island has another claim to fame in that it was the place from which the Maoris sailed for New Zealand just over 600 years ago. The actual point of departure was the Ngatangiia Channel, which is shown on the ½d. value, also illustrated here.

The 6d. value shows a village scene on Tongareva. A native home in Rarotonga is shown on the 8d. value, and on the 2/– stamp a native hut and palms can be seen, with a native climbing one of the trees. The 3d. value has on it a map of Aitutaki, the principal island in the group. The remaining values have more modern subjects for their design. The 5d. value shows a "Dakota" landing on the airfield at Rarotonga, while the 3/– value illustrates the "*Matua*," a vessel that formerly maintained the service between New Zealand and the island, a trip of 1,634 miles.

Next month I shall deal with the stamps of Niue, which was discovered by Captain Cook in 1774.

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For other Stamp Advertisements see page 376.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

THERE was a time when most collectors put their stamp albums away during the summer months and brought out their cricket bats, but with so many tempting stamps about, not even the cricket bat can entirely overshadow those bits of paper. That comment is prompted by the sight of a set of stamps issued recently in the Portuguese colony of Angola. This is being called the bird set, and more than 20 values will be available when the set is complete. Each of the stamps depicts in natural colours a bird that is to be found in the territory, and how our bird watchers would revel in an opportunity to get their glasses on such feathered wonders! These stamps have been printed by the famous Swiss firm of Courvoisier.

It is fair to say that the new British 2/6 and 10/- stamps have been favourably received, but the less one says about the designs of the "Exhibition" set the better. Just examine the 2½d. value, for instance. Could anything be more trite or unfitting? The 4d. is not much better, though here some understanding of the art of stamp design is manifest; but no one could possibly claim that such a set of stamps is worthy of a local flower show, let alone such a mighty project as the Festival of Britain.

Just compare our amateurish stamps with the modest little set issued by Turkey to commemorate their exhibition. To see the real difference one should have a copy of the Turkish stamp illustrated here along with a copy of our own, say the 2½d. value. If that did not drive home to us just what a poor philatelic job our authorities are doing nothing would.

How time really does fly can be noted from the sets issued by various countries to commemorate the centenaries of their first postage stamps. Many collectors will remember the fuss our own Post Office made when it was suggested in 1939 that Great Britain should issue a set of stamps, or even a single stamp, to commemorate the centenary of the world's first stamp, the "Penny Black." We got our set in the end, but collectors looking forward felt that it would be a long time before other countries would be able to celebrate the centenaries of their first postage stamps, for Great Britain had been well ahead of the rest of the world. But that time has soon slipped past, and one country after another is now taking a philatelic bow.

Italy has produced a set on these lines, and for once the designs are poor enough to have been produced by our own Post Office. Still they are of interest, if it is only to allow us to illustrate in our collections stamps of which we are never likely to own originals. But how nice it would be to own a perfect specimen of the Tuscany stamp depicted in the one illustrated!

Canada is doing something very much the same, but besides the 15c. stamp showing a copy of the "Threepenny Beaver," three other stamps will come out on 24th September. These latter stamps will really tickle philatelic palates, for while art may have flown out of the window while the designers were at work, they have at least provided faithful sketches of age-old methods of transport, as well as modern prototypes of such things.

Few countries have more popular stamps than Canada, for not only do they provide attractive stamps, but huge numbers are issued and all collectors can afford copies.

The new set is to commemorate the centenary of the transfer of the postal administration. Canada was the first colony of British North America to issue its own postage stamps, which it did on 23rd April 1851, and now it beats the Mother Country hollow at the job.

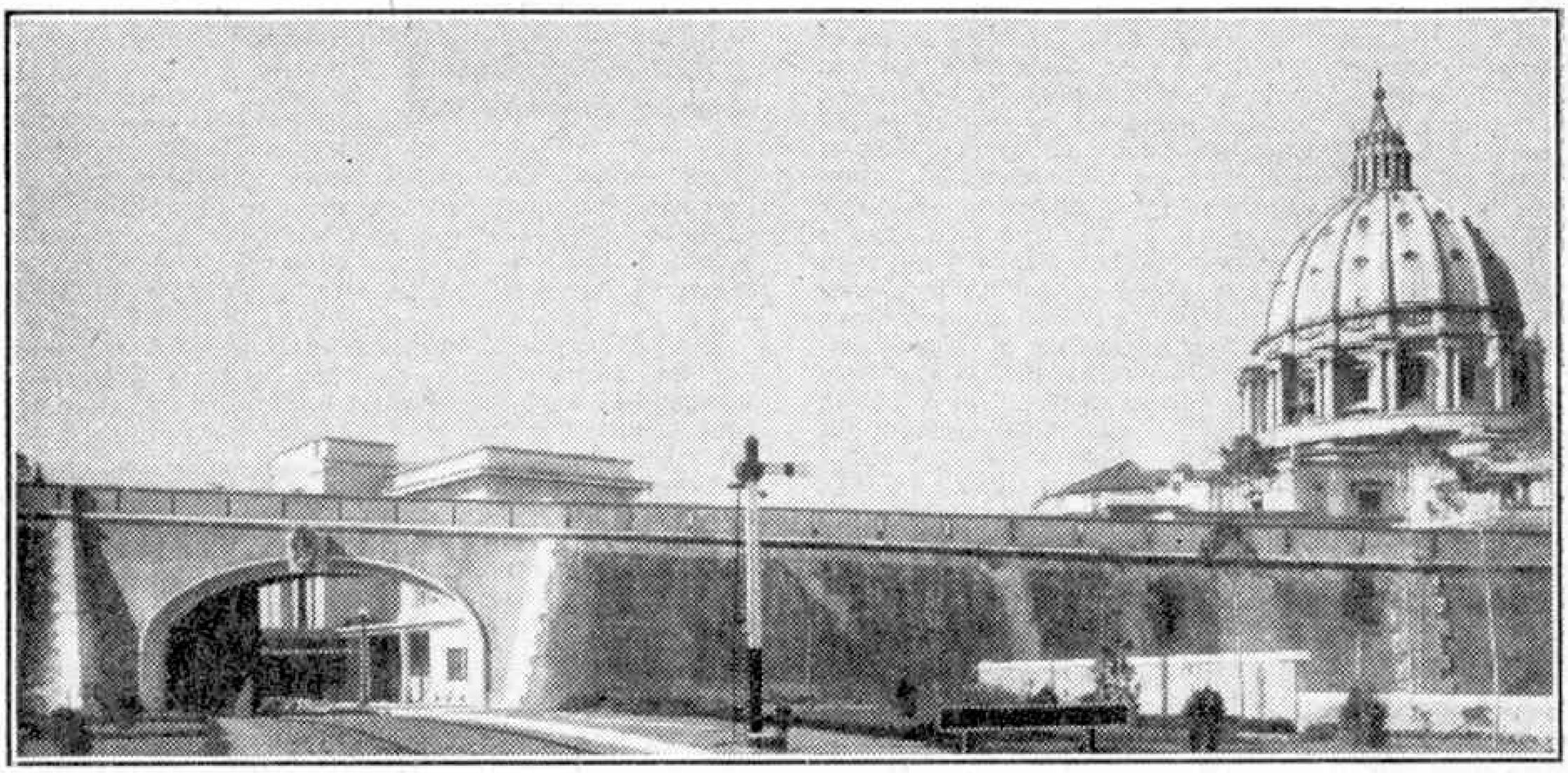
One by one the West Indian colonies are changing their stamps, and all the new sets are in dollars and cents instead of pence and shillings. Apart from this we are getting some very attractive designs, the latest being from Dominica. Apparently Jamaica will not change its currency, but a new set altogether is overdue. These West Indian stamps are exceedingly popular in the U.S.A. and as the values are expressed in dollars they may become more popular still, for an American never seems to be able to master our currency. The West Indian dollar has nothing to do with the U.S.A. or Canadian dollar, for it is only worth 4/2.

India has recently introduced two new stamps and other changes are in the offing. There was a time when used Indian stamps were very common, but some of the values of the present set seem quite elusive; so before other changes take place, it will be a wise move to complete the set. For instance, the 3½a. seems to be very difficult to get hold of used. It will be a nice little stamp one day.

And here is another used stamp which needs a lot of finding—the 5d. of Gambia. It might even be off sale, so seldom is it seen in the used state. For some unaccountable reason the stamp is apparently rarely in stock at the post office.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.



The Vatican City Railway passes through the Fabbrica, a gate in the City wall. Photo. by F. J. Knight, West Ewell.

THE WORLD'S SHORTEST RAILWAY

The shortest and one of the most interesting railways in the world is the 300 yd. double track that branches from the Italian main line just outside Rome to serve Vatican City. The accompanying photograph shows the entrance to Vatican City, guarded by a huge iron sliding door set in the arch of the city wall. This gate, the Fabbrica, is rolled aside under the supervision of the Papal guard two or three times a week to allow a line of goods wagons to enter or leave.

The Vatican station and the private tracks were presented to the Pope by the Italian Government in 1931, following the settlement of a dispute over Papal lands which had lasted for 60 years. The Station is one of the most beautiful in the world, and the Papal waiting room in particular is an architectural gem of white, green and yellow marble. Yet the waiting room and the station buildings have never been used, and no passenger train has ever run on the Vatican railway in the 20 years of its existence.

The importance of this little-used railway to the Pope is that no Italian customs or import duties are payable on merchandise consigned to Vatican Station, and the Italian State Railways give a rebate of up to 60 per cent. of their rail charges on certain goods for Vatican City.

F. J. Knight (West Ewell).

BLENHEIM PALACE

Blenheim Palace, in Oxfordshire, the seat of the Duke of Marlborough, is the largest mansion designed by the famous architect Sir John Vanbrugh. When I visited it I passed through the Triumphal Gate at Woodstock into the Park, studded with old oaks, which has an area of 2,500 acres and is 12 miles in circuit.

The Palace received its name from the Danube village where the first Duke of Marlborough won a glorious victory over the French and Bavarians in 1704. The main entrance leads to the Great Hall which is 67 ft. high and has a very fine painting on the ceiling, depicting Marlborough victorious, with the battle order at Blenheim. Near the Great Hall the visitor is shown the room where Mr. Winston Churchill was born in 1874. Several Drawing Rooms, Three State Rooms, and the Long Library, which is 183 ft. long, are visited and greatly admired, as is also the Saloon with its paintings on the walls and ceiling. The tour is concluded by visiting the Chapel, which is very plain except for the Rysbrack Monument, with its marble decorations of figures, trophies and medals, which was erected as a memorial to the first Duke and Duchess and their two sons. The gardens on the east and west fronts are very elaborately laid out and in keeping with the magnificence of the Palace.

I thoroughly enjoyed my visit to this great English home of a noble line of Dukes.

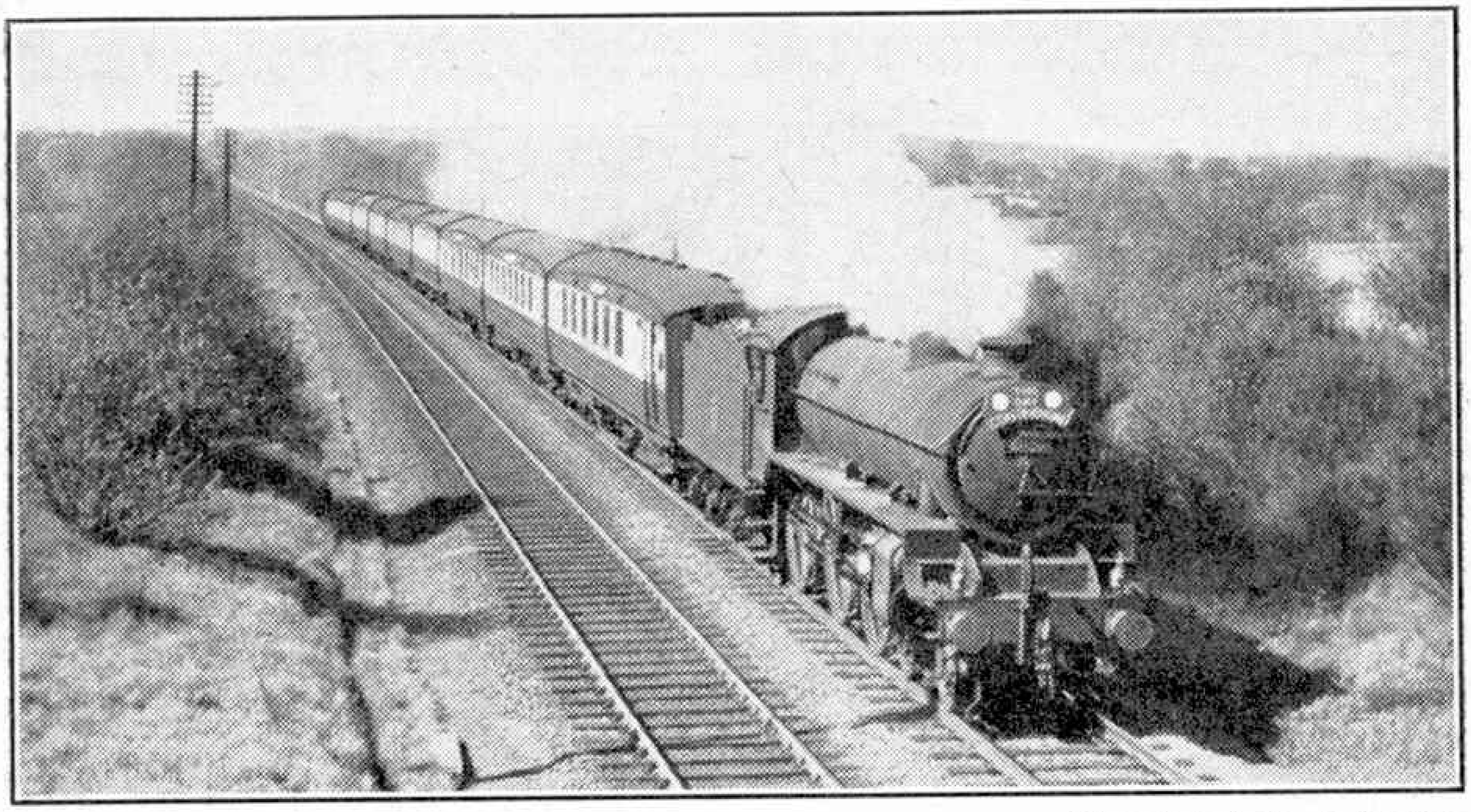
G. Oates (Doncaster).

Blenheim Palace, built over 200 years ago for the Duke of Marlborough. Photograph by G. Oates, Doncaster.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Can You Name These Trains?



Photograph by R. E. Vincent.

Named trains such as the one illustrated on this page give an air of romance to railways in addition to providing speedy and comfortable travel. The names of 10 of these trains, mostly British, form the subjects of our chief contest this month. Clues to these are given below, and readers are asked to work out from them the exact names of the trains. In addition their entries must give the name of the British Region or other Railway authority owning each, with the route on which it runs.

Here are the clues to the 10 trains concerned:

1. A west coast flower.
2. Apparently a county man, but in reality only a visitor.
3. Doesn't fly to the mountains and is not jet driven, in spite of its name.
4. No night travel is indicated.
5. A ghostly advance down under?
6. The world's most expensive missile?
7. Skilled in his trade.
8. Adventurous spirit of Erin.
9. Mythical creature proclaims its colour.
10. Broad acres luxury.

There will be two sections, for Home and Overseas readers respectively, and in each prizes of 21/–, 15/– and 10/6 will be given for the best efforts in order of merit. Entries must be addressed "*August Named Trains Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing Dates: Home Section, 29th September; Overseas Section, 31st December.

Tell Us Your Best Holiday Story

Whether in the country, among the mountains and lakes, or at the seaside, readers on holiday this month will meet interesting people and see unusual sights, or will have amusing experiences. These should give them opportunities for good holiday stories, and we ask them to send these in as entries in this contest. The stories are limited to 250 words, and the judges will base the awards on their interest and spirit rather than on their "composition."

Entries must be addressed "*Holiday Story Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be two sections, for Home and Overseas readers respectively, and in each prizes of 21/–, 15/– and 10/6 will be awarded for the best entries in order of merit. There will be Consolation Prizes for other good efforts.

Closing Dates: Home Section, 29th September; Overseas Section, 31st December.

August Photographic Contest

The eighth of our 1951 series of photographic contests is a general one in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents.

The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed "*August Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing Dates: Home Section, 31st August; Overseas Section, 30th November.

NOTE—*Will M. E. Ware, who submitted some railway photographs in the May 1951 Photographic Contest, please send his address to the Editor.*

Marvels of Modern Conveyors—

(*Continued from page 340*)

extremely versatile and adaptable. They are mostly made in easily assembled units and so can be built up to serve any works, no matter how rambling the premises may be. There is seldom anything "tailor-made" about their installation; each is planned specially to cope with the particular type of work or the layout of the building concerned.

Statistics show that in most industries 25 per cent. of accident cases are due to improper handling practice. Investigation has proved that when mechanical handling is employed the accident rate is greatly reduced—another point in favour of modern conveyors.

The Cunning of the Fox—

(*Continued from page 347*)

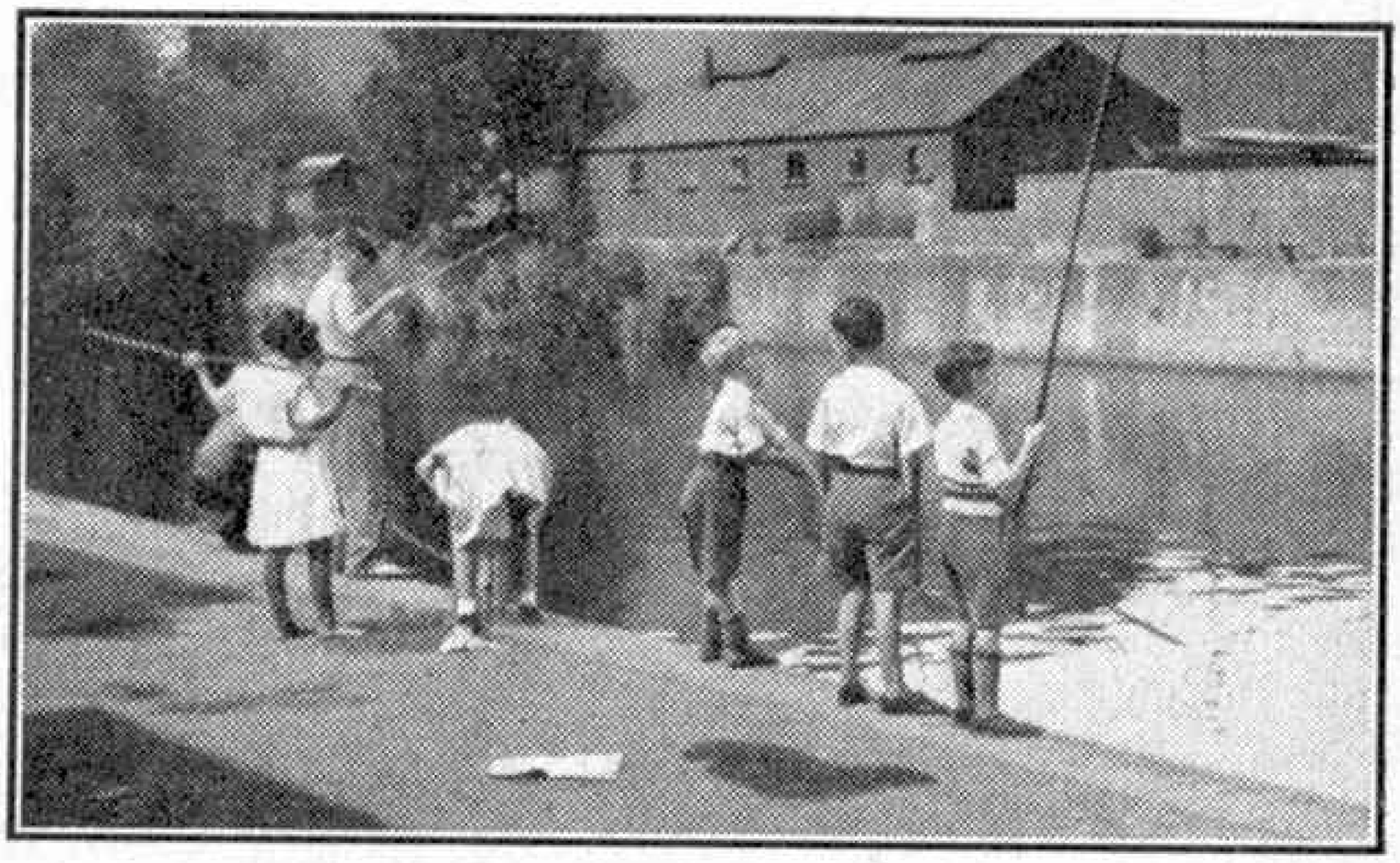
its brush, enticing the farmyard hens, which had hitherto kept out of its reach, within the distance of a pounce. The farmer returned to find that his docile and supposedly contented pet had killed and eaten one of his best layers.

A fox in the wilds does not live, as so many people believe, on the fat of the land, lambs, rabbits and poultry. Far more often its daily ration comprises beetles, grubs, field mice and rats, so that, except in the case of a raiding rogue fox, the animal is a valuable policeman in the countryside, aiding appreciably the work of the stoat and weasel.

It is often said that the fox kills indiscriminately, but just as the dog sensibly buries a bone, the fox often kills more than it requires while there is a good opportunity, burying whatever it does not require against a rainy day. Seemingly not trusting to its memory, the beast usually leaves some portion of the kill sticking up above the ground to mark the larder, a hen with its feathers poking above the surface or rats with their tails showing.

With all these obvious pointers to the cleverness of foxes we must not attribute to them human brain power, though it is very hard sometimes to separate hereditary and instinctive caution from reasoned intelligence.

With the countryside being fast "planned" and agricultural activities intensified, many people are predicting the ultimate extinction of foxes. But those who really know this fast and cunning animal have no fear that reynard will be unable to adapt himself to the new conditions of the modern age.



Young anglers. This delightful snapshot by P. H. Lamb, of Reading, was awarded Second Prize in Section B of the August 1950 "M.M." Photographic Contest.

The Tramp and her Work—

(*Continued from page 356*)

the machinery was fully recognised, but diesel engines had been designed with that idea, and would not only be safe in the hands of rather rough-and-ready engineers but would consume far less fuel and would permit the space saved on bunker stowage to be used for more cargo.

So a greatly improved type of tramp came into existence. Some patent appliances were tried which did not justify their cost for the conditions of tramping work, but on a plain specification the builders turned out a fine workmanlike job whose running expenses were considerably lower than had been accepted a few years previously. First cost was reduced by the acceptance of a large measure of standardisation and, at first experimentally, efforts were made to attract a better type of seafarer by giving greatly improved amenities in his quarters. Some of these efforts were poorly received and every fitting that could be detached was stolen and exchanged for drink; but some were appreciated from the first, and nowadays the man who maltreats the measures taken for his comfort is in the minority and is made to recognise the fact by his shipmates.

Nevertheless, for all the improvements which have been effected, the design of the tramp steamer or motorship remains the same in its essentials. She must have a good carrying capacity—the percentage sacrificed to obtain better lines is really very small—and it must be on as light a draught as possible as a deep ship may lose charters because she cannot get into the port in the charter party. She must have good deck machinery for the handling of her cargo or she may easily be sent to ports which have no proper crane facilities of their own. Her decks should be so arranged that they can take a good deck cargo, possibly timber, should it be required. Her fuel supply, whether it is coal or oil, must be sufficient for a long voyage without deviation to rebunker; and she must, of course, conform with all the strict regulations for the safety of life and the comfort and health of the crew.

Such is the normal modern tramp, her most obvious improvement on her predecessor being that she can generally maintain 10 knots instead of eight; but since the war some tramps of special type have been built with a speed of 14 knots or over by diesel engines and fittings fully equal to those of the cargo liner. During the shortage of tonnage these ships have done quite well, generally on time charters at good rates, but it remains to be seen whether they are really an economic proposition when freights are depressed.

"A Great Eastern Transformation"—

(*Continued from page 359*)

uphill gradients near Chadwell Heath in the course of a non-stop run of approximately five miles through the outer suburbs. Running was comparatively quiet and steady.

Among the fast steam trains observed that afternoon, mainly at Shenfield or at Chelmsford beyond the electrified area, were the "*Scandinavian*" and the "*Broadsman*" hauled by "B1" 4–6–0s. A Felixstowe express was in charge of a rebuilt "Claud Hamilton" 4–4–0 and there were Clacton buffet-car semi-expresses headed by "Sandringham" 4–6–0s. Former G.E.R. type 4–6–0 "B12/3" engines were on many secondary trains, such as the Southend train in the lower picture on page 359.

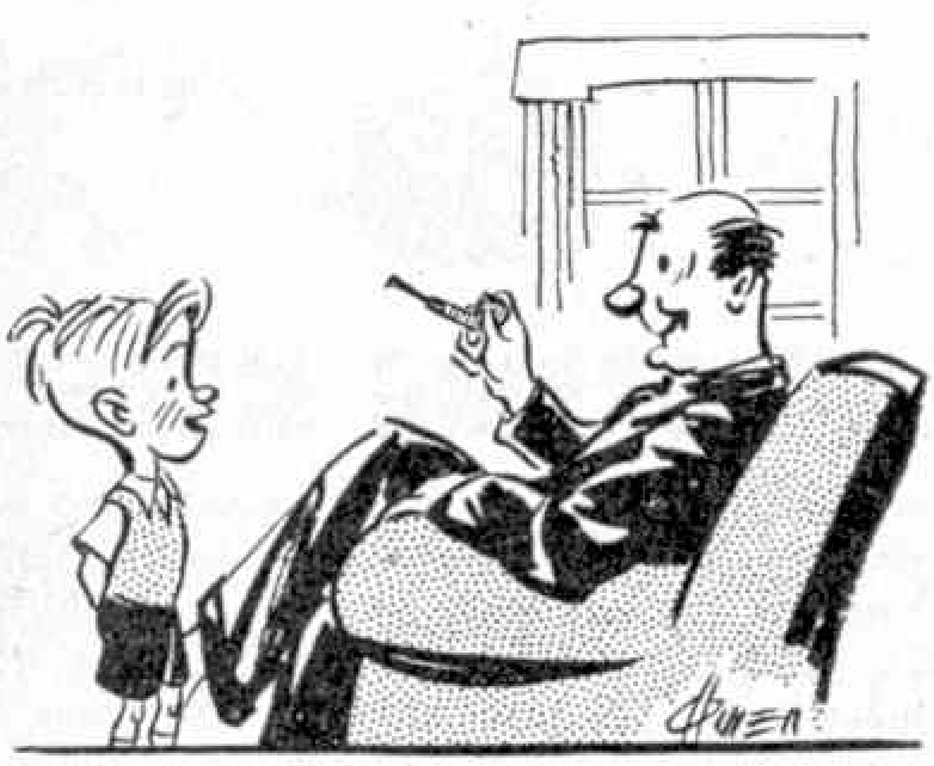
Fireside Fun

"Yes, sir," said the old-time engine driver, "that line over the mountains was so steep our biggest engine could only take one wagon of coal at a time over it, and it burned all the coal in the wagon taking it over."

"But if there was no coal left what was the idea of taking the wagons over?"

"They wanted empty wagons on the other side."

* * * *



"Daddy, last night I dreamt you gave me a shilling!"

"Well as you've been a very good boy lately, you can keep it, Derek!"

* * * *

Holiday Maker: "You said your hotel was only five minutes from the station, and it has taken me nearly an hour to get here."

Haughty Manager: "You must have walked, sir. We only cater for motorists."

* * * *

"Oh, you're just like an aeroplane."

"Because I'm fast and streamlined?"

"No. Because you're no use on earth."

* * * *

"I want my boy to be famous, with his name in everybody's mouth."

"Well, get it engraved on a few million toothpicks and give them all away."

* * * *

Bus Inspector: "You've been standing here a long time, lady. Can I help you?"

Old Lady: "Oh, no. I shan't be long now. The policeman told me I wanted the No. 15 bus, and No. 14 has just gone past."

* * * *

"Why do you look at me like that?"

"I'm the local food inspector!"

BRAIN TEASERS

A SPLENDID START

The diagram below shows the beginning of a kind of crossword, in which only horizontal words and clues are given. The start is an excellent one, as readers will agree, but how does the puzzle continue? The clues below the diagram show this.

M						O
	E				N	
		C		A		
			C			
		C		A		
	E				N	
M						O

1, Produces sparks; 2, plant again; 3, take hold of; 4, go ahead; 5, bring back; 6, downward progress; 7, African state.

* * * *

OF WORLD-WIDE INTEREST

Here is a well-known national event, but the letters of its name are represented by numbers.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

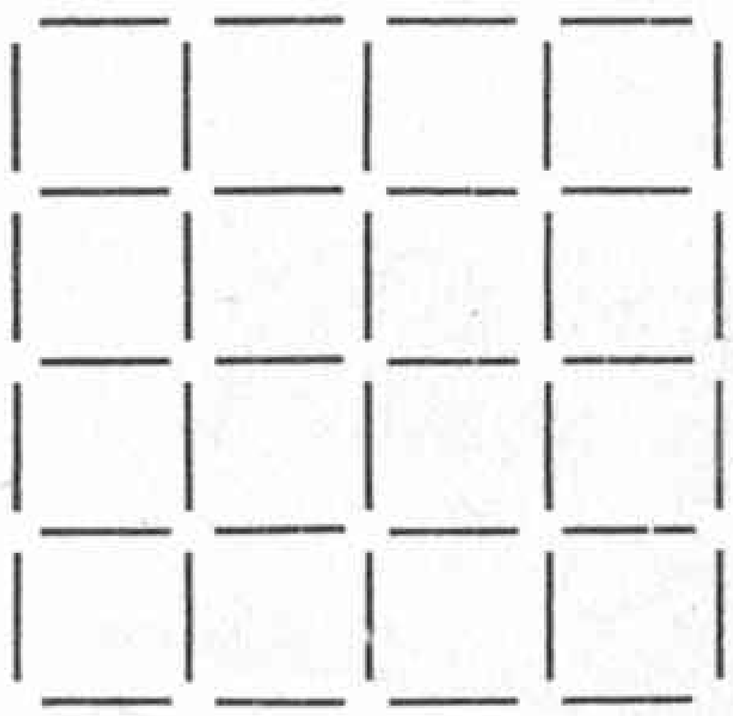
No doubt the really alert will already have guessed what this is. For the others we add the information that the letters 6, 13, 17 and 2 spell a climbing plant; 3, 8, 15, 6 and 2 an unpaid servant; 1, 9, 12, 4, 12, 2, 3 and 3 a strong point that flew; and 3, 14, 7, 4, 5, 9 and 17 a word that might represent Waterloo. What would 10, 16 and 11 spell?

K. J. B.

* * * *

MATCH WORK

Each line in the diagram below represents a match, 40 of them. How many squares do they form?



Now take away 16 of the matches, but leave only two squares.

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The words indicated by the seven clues in our first puzzle are Hang, Ever, Rule, Brig Echo, Roar and Troy. The Christian names at top and bottom of the diagram are HERBERT and GREGORY.

Our second puzzle was just a catch. The number of ears of corn brought out of the old box by the rat was 15, one for each journey; the other two ears brought on each trip out were his own.

If the first time in our third puzzle was X minutes past 11, the difference between the two times is obviously 1 hr. X min., so that X must be 14 minutes. The time required therefore is 12.28.

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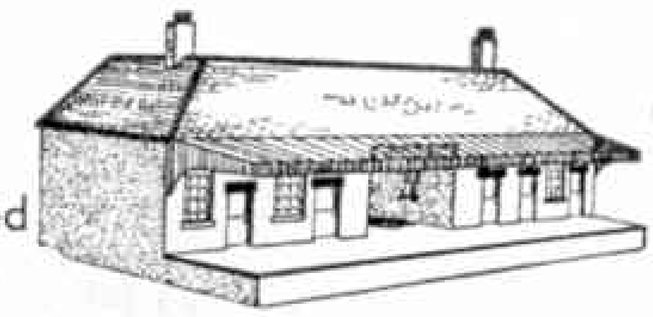

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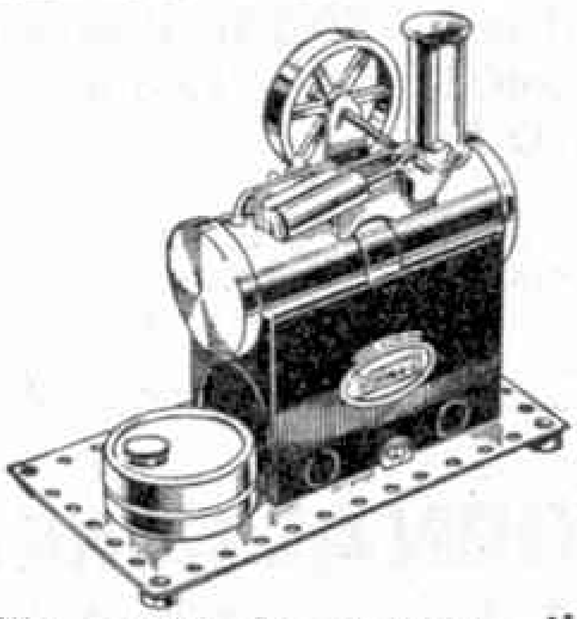

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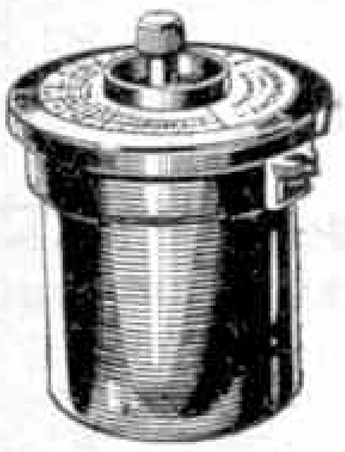

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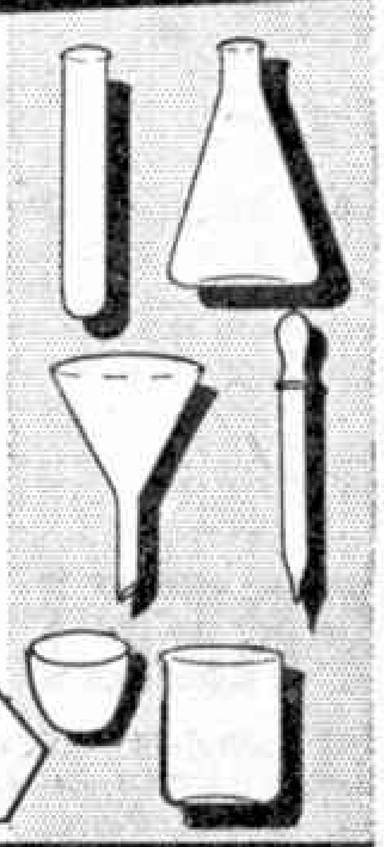

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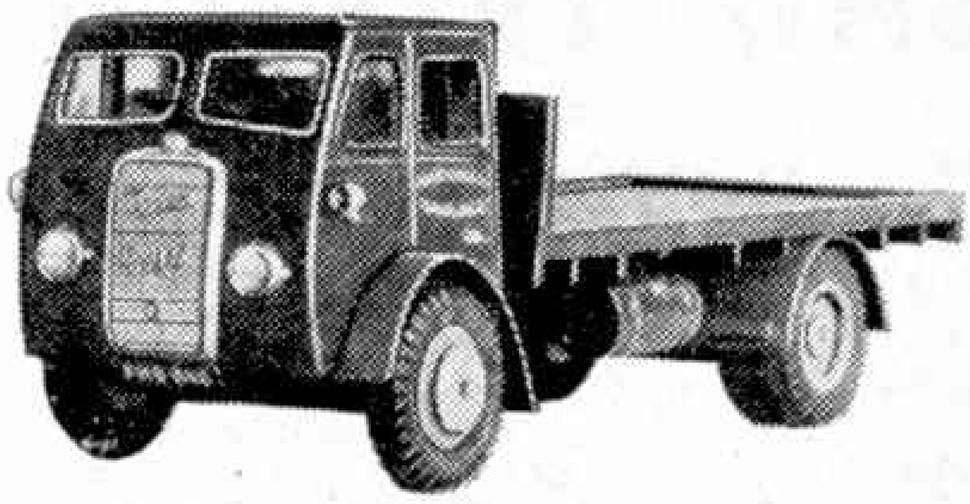

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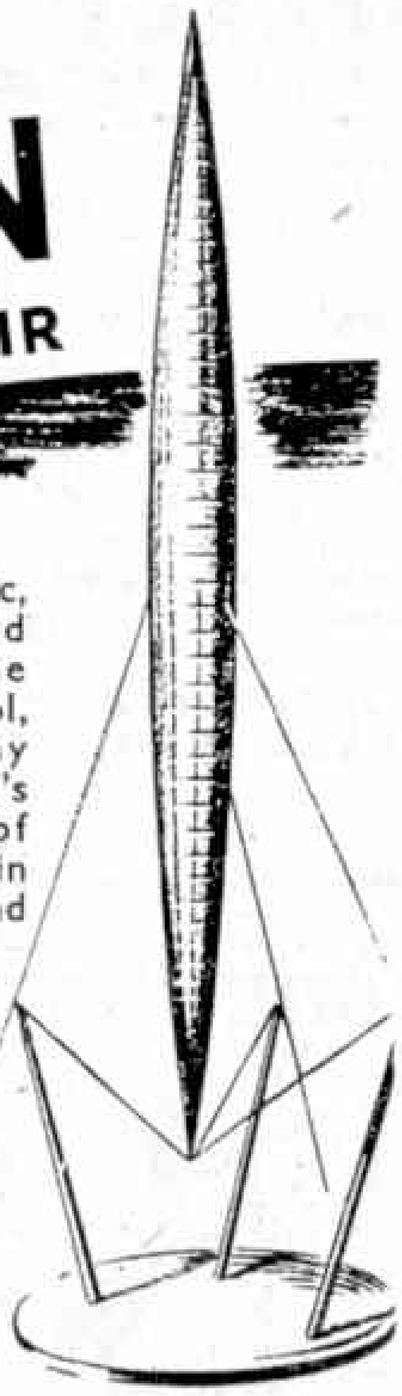

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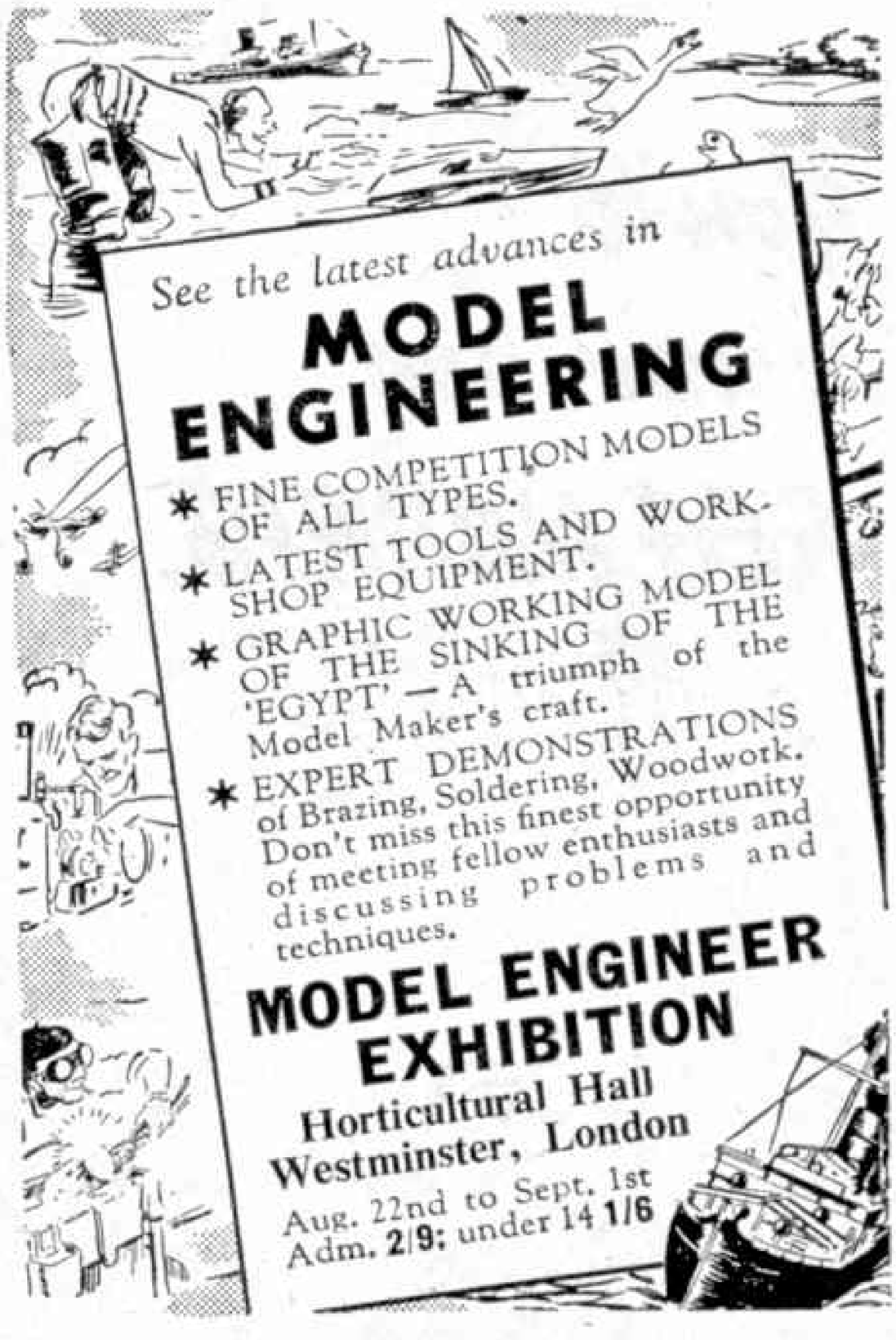

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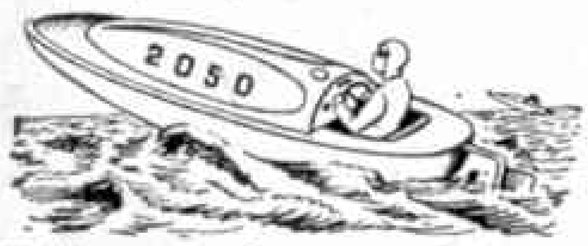

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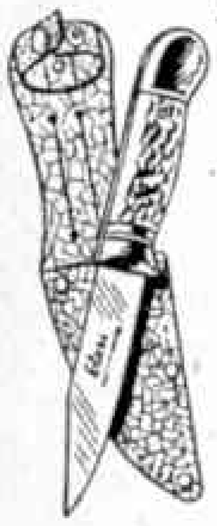

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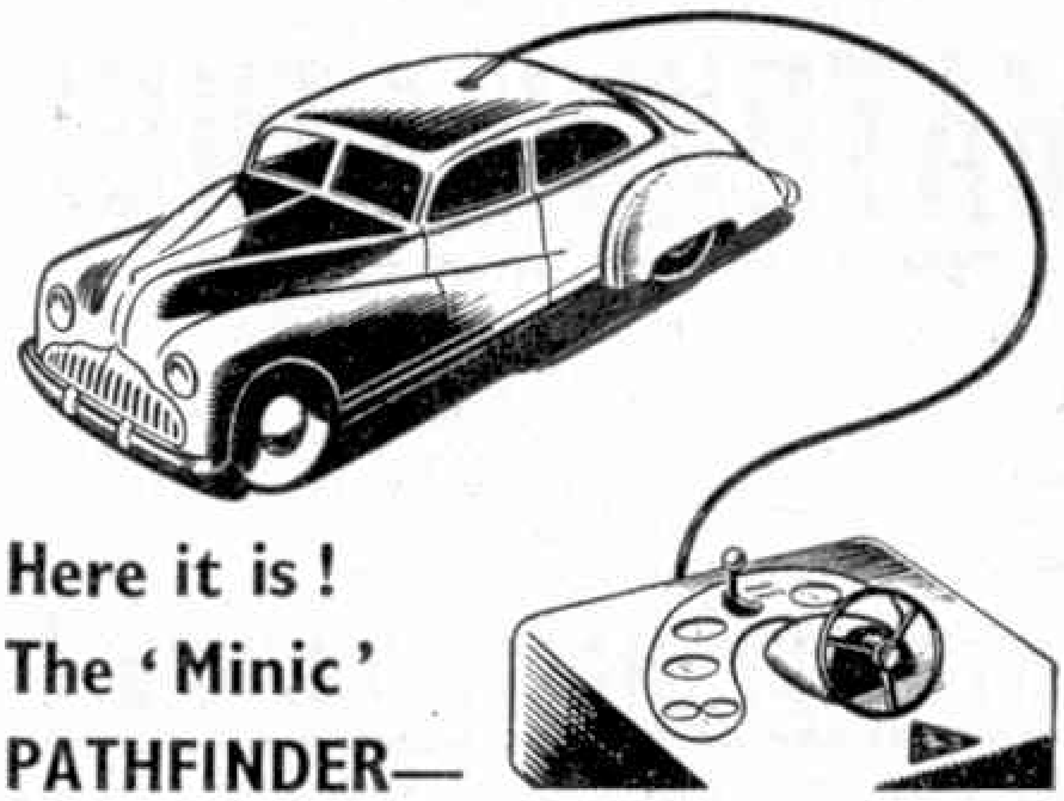

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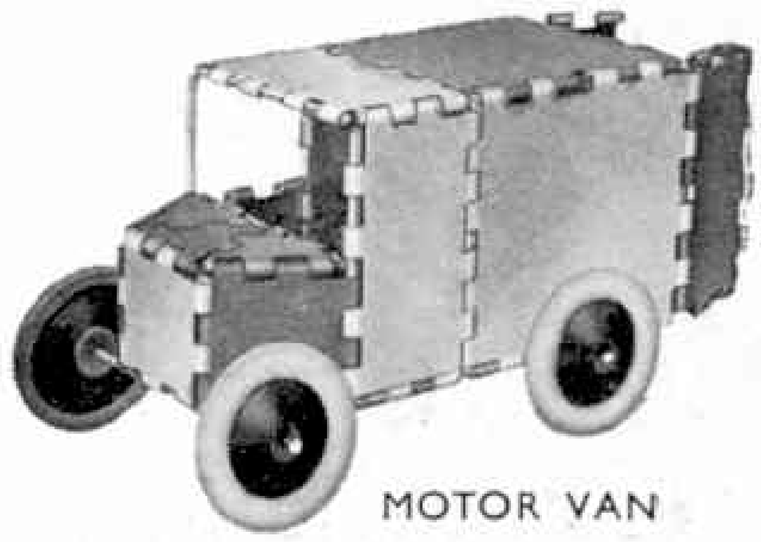

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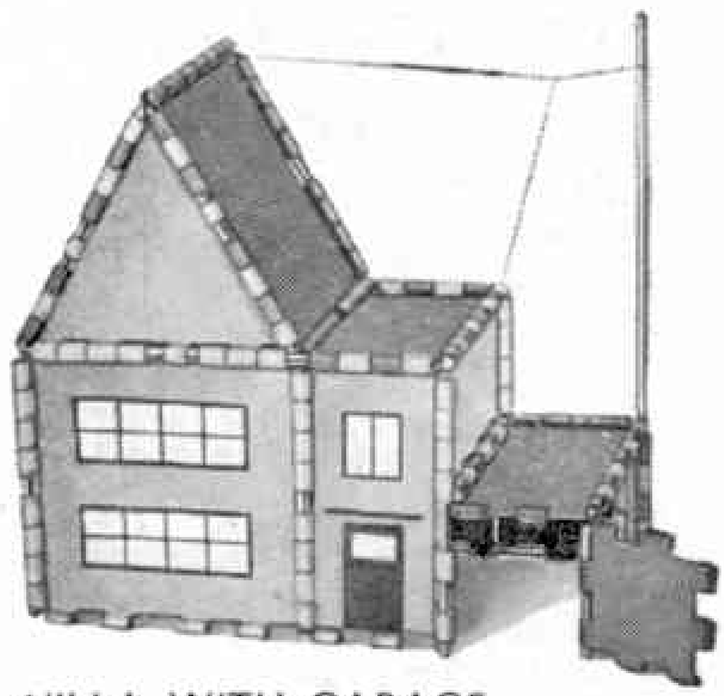

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